

HPV VACCINE ACCESS AND CERVICAL CANCER POLICYMAKING PROCESS: A  
COMPARATIVE GOVERNMENTAL PRIORITY SETTING STUDY OF GHANA, RWANDA,  
AND CANADA

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## ABSTRACT

Cervical cancer is a global health issue that claims over 600,000 lives yearly. While high-income countries (HICs) record lower incidence rates of cervical cancer, the opposite is true for underserved regions, such as sub-Saharan Africa (SSA), where a significant burden of global cervical cancer cases are reported. Over 70% of all cervical cancer is caused by high-risk (strain 16 and 18) human papillomavirus (HPV). Currently, prophylactic vaccines, Gardasil® and Gardasil9®, manufactured by Merck; Cervarix®, manufactured by GlaxoSmithKline (GSK); and Cecolin® manufactured by Xiamen Innovax Biotech Co, prevent HPV-related cervical cancer. However, most low- and middle-income countries (LMICs) national immunization programs do not include these vaccines. The thesis explores governmental priority settings and the policymaking imperatives for nationwide HPV vaccination in Canada, Rwanda, and Ghana. Ghana, a LMIC, has a cancer policy that covers cervical cancer; however, it lacks a specific policy governing the prevention and control of the disease. Rwanda (also a LMIC), on the other hand, was the first country in sub-Saharan Africa to implement a nationwide HPV vaccine program that aims to reduce and eventually eliminate cervical cancer case incidence and mortality. Canada, one of the first Organization for Economic Cooperation and Development (OECD) nations to implement province-wide HPV vaccination programs, provides instructive health policymaking propositions. Primary and secondary data were collected to develop country-specific case studies on the imperatives for the HPV vaccination program/policy in each country. A comparative analysis supports understanding the similarities and dissimilarities in policymaking and the environment within which the HPV vaccine and cervical cancer program were planned, formulated, and organized for implementation as a health intervention instrument. The results show different policy convergence and divergence nodes among the countries studied as governments look for solutions to public problems. Because governments have myriad competing public problems to address, selectively solving some problems and leaving others may depend on priorities and available resources. Prioritizing and deciding to act by implementing public HPV vaccination programs in HICs, such as Canada, and LMICs, such as Rwanda, and not acting due to resource constraints reveals that governments can leverage creative approaches to act on a public problem successfully with or without plentiful resources.

## **DEDICATION**

I dedicate this work to all women, especially those in underserved regions, who grapple daily with preventable diseases, such as HPV-related cervical cancer.

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## TABLE OF CONTENTS

ABSTRACT.....	II
DEDICATION .....	III
ACKNOWLEDGEMENTS .....	IV
TABLE OF CONTENTS.....	V
LIST OF TABLES.....	IX
LIST OF FIGURES .....	IX
1 Introduction .....	1
1.1 Research topic background.....	1
1.2 Health equity and HPV vaccine uptake .....	4
1.3 Research problem statement.....	7
1.4 Situational context in Canada, Rwanda, and Ghana .....	8
1.4.1 Canada.....	8
1.4.2 Rwanda.....	9
1.4.3 Ghana .....	9
1.5 Bridging the policy gap.....	10
1.6 Research objectives.....	11
1.7 Research question.....	11
1.8 Research scope .....	12
1.9 What the research seeks to inform.....	12
1.10 Research relevance .....	12
1.11 Research guiding hypothesis.....	13
1.12 My motivation for this research.....	13
1.13 Research methodology .....	13
1.14 Rationale for comparing Canada, Rwanda, and Ghana for the study.....	14
1.15 Approach for country specific case composition .....	17
1.15.1 Canada.....	17
1.15.2 Rwanda.....	18
1.15.3 Ghana .....	18
1.16 Theoretical frameworks .....	18
1.17 Outline of chapters .....	19
2 Research Gap in HPV Vaccine and Cervical Cancer Policy and Policymaking Process in Sub-Saharan Africa: A Scoping Review .....	21
2.1 Abstract.....	21
2.2 Introduction .....	21
2.3 HPV vaccine and cervical cancer policy research in sub-Saharan Africa.....	23
2.4 Scoping review rationale.....	24
2.5 Scoping review as a panoptical overview .....	25
2.6 Methodological framework .....	25
2.7 Research question.....	25
2.8 Identifying relevant studies.....	25
2.9 Study selection.....	26
2.9.1 Exclusion criteria .....	26
2.9.2 Inclusion criteria .....	26
2.10 Charting the data .....	27
2.11 Collating, summarizing, and reporting the results.....	28
2.12 Discussion.....	36
2.13 Conclusion.....	38
2.14 Limitations.....	38
3 Public health policymaking process .....	40
3.1 Abstract.....	40
3.2 Introduction: .....	40

3.3	Understanding policymaking .....	41
3.4	Policy and public problem .....	42
3.5	Policy actors and dynamics .....	44
3.5.1	Interest groups .....	44
3.5.2	Policy entrepreneurs .....	45
3.5.3	Policy networks .....	46
3.5.4	Issue networks.....	46
3.5.5	Policy communities .....	47
3.6	Priority setting and policymaking.....	48
3.6.1	Policy instrument.....	48
3.7	Resource allocation and priority setting .....	48
3.8	Policy success and failure.....	53
3.9	Conclusion .....	55
4	Political will as a determinant of public health policymaking: towards nationwide HPV vaccination programs .....	56
4.1	Abstract.....	56
4.2	Introduction .....	56
4.3	Cost effectiveness of HPV vaccination program .....	57
4.4	Political will and HPV vaccine policy challenges.....	59
4.5	HPV vaccine policymaking process .....	61
4.6	HPV vaccine policymaking navigation in high income countries .....	63
4.7	HPV vaccine policymaking navigation in low-middle income countries .....	68
4.8	Conclusion.....	71
5	Research methodology .....	73
5.1	Overview .....	73
5.2	Theoretical frameworks .....	73
5.2.1	Sensemaking: understanding stakeholders' rationale for policy choices.....	73
5.2.2	Multiple Stream Framework (MSF): understanding the policymaking process .....	74
5.2.3	Actor-Network Theory: description and evaluation of actors.....	77
5.2.4	Human Rights Framework (HRF): understanding the research problem in terms of the right to health, actors' actions, and responses related to vaccine access.....	78
5.3	Qualitative research approach.....	80
5.4	Quantitative research approach .....	81
5.5	Mixed methods approach .....	82
5.6	Research method selection.....	83
5.7	Analytical frameworks.....	84
5.7.1	Thematic analysis .....	84
5.7.2	Document analysis .....	84
5.7.3	Computer assisted qualitative data analysis (CAQDA) .....	85
5.8	Data collection consideration .....	85
5.9	Data collection strategy and analysis.....	85
5.10	Data collection inclusion criteria.....	86
5.11	Anticipated study challenges .....	86
5.12	Research ethics and consideration .....	87
5.13	Research data protection and confidentiality.....	89
6	The Canada case study: Recasting the nationwide HPV vaccination program in Canada - Sensemaking policy approach in Ontario.....	90
6.1	Abstract.....	90
6.2	Introduction .....	90
6.3	Health governance system in Canada .....	91
6.4	Vaccination program in Canada .....	95
6.5	HPV vaccination policymaking .....	98
6.6	The HPV vaccine policymaking process in Ontario .....	103

6.7	Methodology.....	106
6.8	Scoping review .....	107
6.9	Identify research question .....	107
6.10	Identifying relevant studies.....	107
6.11	Study selection .....	108
6.11.1	Exclusion criteria .....	108
6.11.2	Inclusion criteria .....	108
6.12	Charting the data .....	108
6.13	Collating, summarizing, and reporting the results.....	109
6.14	Discussion.....	116
6.14.1	Policymaking approach .....	116
6.14.2	Actor influence in vaccine policymaking .....	122
6.14.3	Cervical cancer prioritization.....	123
6.14.4	Vaccine purchase negotiation and introduction .....	124
6.14.5	Right to health .....	124
6.15	Conclusion.....	125
6.15.1	Limitations.....	127
7	The Rwandan case study: Human papillomavirus (HPV) policymaking process in Rwanda-How political will and priority setting redefines health in LMIC Settings.....	129
7.1	Abstract:.....	129
7.2	Introduction .....	129
7.3	Theoretical lens .....	132
7.4	Methods.....	133
7.5	Health as a human right in Rwanda .....	134
7.6	Problem stream.....	137
7.7	Policy stream.....	137
7.8	Politics stream.....	138
7.9	Policy entrepreneurs.....	140
7.10	Policy window .....	140
7.11	Discussion.....	142
7.11.1	Policy network stability .....	142
7.11.2	Governance system in Rwanda and its effect on health policymaking.....	144
7.11.3	Local policy frameworks-Imihigo.....	146
7.11.4	Role of private partners as policy entrepreneurs.....	147
8	The Ghana case study: Imperatives for nationwide HPV vaccination program for cervical cancer prevention.....	153
8.1	Abstract.....	153
8.2	Introduction .....	153
8.3	The Gavi factor .....	157
8.4	Governance system in Ghana .....	158
8.4.1	Chieftaincy as an apolitical policymaking buffer .....	160
8.4.2	Power devolution and governance .....	160
8.4.3	Women and governance in Ghana.....	161
8.5	Healthcare and health insurance system in Ghana.....	163
8.6	Health priority setting and policymaking process.....	164
8.7	Theoretical lens .....	166
8.8	Ethical approval.....	167
8.9	Confidentiality.....	167
8.10	Methodology.....	167
8.10.1	Online surveys .....	167
8.10.2	Interviews.....	169
8.11	Findings .....	171

8.12	Discussion.....	174
8.12.1	Vaccination success predictors.....	174
8.12.2	Awareness of HPV .....	176
8.12.3	Priority settings and resource allocation.....	177
8.12.4	Political Will and Expediency.....	180
8.12.5	Policy accountability.....	185
8.12.6	Right to health.....	187
8.12.7	Proposed approach to health policymaking.....	189
8.13	Conclusion.....	190
8.13.1	Limitations.....	192
9	HPV vaccine access and cervical cancer policymaking process: A comparative governmental priority setting study of Ghana, Rwanda, and Canada. ....	193
9.1	Abstract.....	193
9.2	Introduction .....	194
9.2.1	What is comparative analysis? .....	194
9.2.2	Validity and reliability of cross-national comparative analysis .....	196
9.3	Study objectives .....	199
9.4	Study methodology.....	199
9.5	Study design .....	200
9.6	Data collection .....	200
9.7	Emerging concepts, contents, and context.....	201
9.7.1	Country context.....	201
9.7.2	Public health policy and governance systems .....	204
9.7.3	Women in politics: A catalyst for policymaking success .....	208
9.7.4	Priority settings and resource allocation.....	210
9.7.5	Policymaking Process: HPV vaccine acceptability and funding .....	213
9.8	Policymaking considerations among the countries .....	216
9.9	Situational pointers.....	219
9.10	Summary of case studies (Canada, Rwanda, Ghana).....	220
9.11	Way forward .....	224
9.12	Research contribution to health policymaking .....	228
9.12.1	Schematic policymaking process framework .....	228
9.12.2	Policy choice stability check .....	229
9.12.3	Strength and Limitations .....	230
9.13	Conclusion.....	231
10	REFERENCES.....	233
11	APPENDICES .....	256
	Appendix 1: A historical perspective on HPV associated cervical cancer and HPV vaccine discovery.....	256
	Appendix 2: Vaccines, vaccination, and anti-vaccines: an unending public health standoff.....	262
	Appendix 3: Inform consent form .....	266
	Appendix 4: Online inform consent and survey questionnaires .....	268
	Appendix 5: Sample interview questions.....	275
	Appendix 6: Interview Strategy.....	280
	Appendix 7: Post interview log form.....	281
	Appendix 8: Ghana: SPSS Statistical Analysis for Survey Results .....	282
	Appendix 9: Actor-interest and allocation of power/influence in HPV policymaking.....	287
	Appendix 10: Poster Certificate for thesis chapter presentation.....	288



## LIST OF TABLES

TABLE 1: SUB-SAHARAN AFRICAN COUNTRIES WITH HPV VACCINATION PROGRAM.....	6
TABLE 2: HEALTH EXPENDITURE PER CAPITA (IN USD) .....	15
TABLE 3: SCOPING REVIEW DATA TABULATION.....	28
TABLE 4: ARTICLES INCLUDED IN THE REVIEW OF RESEARCH IN HPV VACCINE AND CERVICAL CANCER POLICY AND POLICYMAKING PROCESS IN AFRICA .....	30
TABLE 5: KINGDON MSF TAXOLOGY.....	75
TABLE 6: ERICKSON-DE WALS FRAMEWORK FOR ASSESSING CANADIAN IMMUNIZATION PROGRAMS .....	97
TABLE 7: A SUMMARY OF HPV POLICYMAKING JOURNEY IN CANADA .....	99
TABLE 8: PRIMARY SCHOOL-BASED HPV VACCINATION COVERAGE RATES AMONG CANADIAN PROVINCES AND TERRITORIES (DATA FOR GIRLS ONLY)* .....	102
TABLE 9: DATA CHARTING .....	111
TABLE 10: INCLUDED PUBLICATION CONTEXT EXTRACT: .....	114
TABLE 11: PROPOSED POLICY CHOICE STABILITY ESTIMATOR .....	119
TABLE 12: POLICY CHOICE STABILITY CHECK (PCSC) OF ONTARIO’S HPV POLICYMAKING PROCESS.....	121
TABLE 13: PERIPHERAL STAKEHOLDER RESISTANCE AND POLICY NETWORK MANEUVERABILITY .....	139
TABLE 14: ACTOR INTEREST VERSUS POWER/INFLUENCE IN POLICYMAKING .....	182
TABLE 15: KELLOW’S VIEW OF LOWI’S INTEREST-GROUP THEORY .....	184
TABLE 16: CERVICAL CANCER PREVALENCE PER 100,000 WOMEN (2020) .....	203
TABLE 17: POLICYMAKING CONSIDERATIONS FACTORS .....	217
TABLE 18: SITUATIONAL INDICATORS.....	219
TABLE 19: HPV POLICYMAKING DRIVERS AND OUTCOME.....	222
TABLE 20: GOVERNANCE AND POLITICAL FRAMEWORK.....	223
TABLE 21: HPV VACCINATION POLICYMAKING CHALLENGES IN GHANA AND THE WAY FORWARD .....	226

## LIST OF FIGURES

FIGURE 1: HEALTH EXPENDITURE PER CAPITA FROM 2006-2020.....	15
FIGURE 2: PRISMA FOR RESEARCH IN HPV VACCINE AND CERVICAL CANCER POLICY AND POLICYMAKING PROCESS IN AFRICA. A SCOPING REVIEW FROM GOOGLE SCHOLAR, COCHRANE LIBRARY DATABASE, PROQUEST, AND PUBMED.....	29
FIGURE 3: DATABASE SEARCH FOR ONTARIO HPV VACCINATION POLICYMAKING.....	110
FIGURE 4: ALGORITHMIC REPRESENTATION OF THE PROPOSED POLICY CHOICE STABILITY ESTIMATOR .....	120
FIGURE 5: A GRAPHICAL USER INTERFACE (GUI) OF A POLICY STABILITY CHOICE OUTPUT.....	120
FIGURE 6: SCHEMATIC FLOWCHART OF KINGDON'S MSF FRAMEWORK USED TO UNDERSTAND THE HPV VACCINATION POLICYMAKING PROCESS IN RWANDA .....	142
FIGURE 7: DRIVERS OF THE RWANDA NATIONWIDE HPV VACCINATION PROGRAM DEVELOPMENT AND DEPLOYMENT .....	149
FIGURE 8: WORD CLOUD FOR INTERVIEWS .....	174
FIGURE 9: SCHEMATIC FLOWCHART OF PUBLIC HEALTH POLICYMAKING FOR INTERVENTION .....	189
FIGURE 10: RADAR CHART OF ACTOR INTEREST AND ALLOCATION OF POWER IN HPV POLICYMAKING .....	218

# 1 Introduction<sup>1</sup>

“Women are not dying because of diseases we cannot treat. They are dying because societies have yet to make the decision that their lives are worth saving.” - Dr. Mahmoud Fathala, *Past President of the International Federation of Gynaecology and Obstetrics (FIGO)*.

## 1.1 Research topic background

One life lost is one too many to ignore, but when it comes to cervical cancer, nearly a thousand women die each day from the disease globally. Cervical cancer is the fourth leading diagnosed type of cancer among females and affects over half a million females globally in a year. It has been established that cervical cancer is etiologically linked to high-risk human papillomavirus (HPV) infection (Gissmann et al., 1984; Hausen, 1987; Syrjänen & Syrjänen, 2008).

In the process of HPV infection leading into cervical cancer, a precancerous condition is firstly developed whereby the cells around the cervix undergoes dysplasia (Public Health Agency of Canada, 2017). Late treatment or the lack thereof may lead to cervical cancer, however, it is important to mention that not all cases of dysplasia cause cancer. Two strains of HPV (16 and 18) have been linked to cause over 70% of all uterine cervical cancer (Clifford et al., 2006; Kim, 2017; WHO, 2019a; Okunade, 2020). In 2018 alone, it is reported that about 570,000 new cases of cervical cancer were reported globally with 311,000 deaths (WHO, 2019). An assessment of global cancer burden, utilizing information from the GLOBOCAN 2020 estimates of cancer incidence and mortality, indicated that there were 604,000 new cases and 342,000 deaths from cervical cancer globally (Sung et al., 2021, p. 23). That is an increase of 97,000 new cases and 31,000 deaths from 2018 to 2020. According to the HPV Information Center, about 2,434 million females under the age

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<sup>1</sup> Part of the introduction chapter is published and APA citable as: Asempah, E. (2021). Cervical Cancer prevalence in sub-Saharan Africa and HPV vaccination policy: a public health grand challenge? *Journal of Cancer Immunology*, 3(2), 87-97.

of 15 years are at risk of cervical cancer in Low and middle income countries (LMICs), of which 532,239 are diagnosed annually leading to 312,373 deaths (58.7% mortality rate) (Bruni, et al., 2023, p. v). The high prevalence of the disease in LMICs (approximately 90% in 2015 with a mortality rate that is 18 times higher than that in developed nations (Cohen et al., 2019, p. 169) has been attributed to the lack of political will, cultural aspects, and poor health systems to timely identify and treat precancerous lesions (Cuzick et al., 2008; Kidwell Drake et al., 2010; Wigle et al., 2013).

Comparatively, high-income countries (HICs) recorded lower incidence rates of cervical cancer and continue to do so (De Vuyst et al., 2013; Black & Richmond, 2018). The low incidence rate in HICs has been attributed to policy decisions and actions such as cervical cancer screening to detect and treat occurrences at an early stage, and the introduction of HPV vaccination programs (Bonanni et al., 2011; De Vuyst et al., 2013; Bonanni et al., 2015). For instance, it is reported that a woman in the U.S. has a 70% chance of surviving cervical cancer while the survival chances for a woman in sub-Saharan African is 21% (Okonofua, 2007, p. 7). While this is the case, it is important to mention that cervical cancer mortality rate in the U.S., for instance, has been high among women who live in poverty endemic areas of the country (Siegel et al., 2019; Sung et al., 2021). Continuing evidence shows that regions with a low Human Development Index (HDI) experience a disproportionately higher levels of cervical cancer incidence and mortality (Singh et al., 2012; Mansori et al., 2018; Sung et al., 2021). This supports the high incidence of cervical cancer cases and mortality in sub-Saharan Africa, where HDI has been historically low with high Human Poverty Indices (HPI). The high prevalence of cervical cancer in LMICs delineates a case of global health inequity (Agosti & Goldie, 2007; Lancet, 2012). Gossa and Fetters have referred to this inequity as an ethical problem that expresses an “epidemiological tragedy” needing prioritization from policymakers and international donors (Gossa & Fetters, 2020, p. 126).

While over 200 different strains of HPV exist, about 17 strains have been identified as high-risk strains that cause various types of cancers (e.g., cervix, vulva, vagina, anus, penis, and oropharynx) (Chen et al., 2018; Awua et al., 2020). Of these, strains 16 and 18 have been identified as an etiological cause of cervical cancer (Frazer, 2004; Zimmerman, 2006; Castellsagué, 2008; Crosbie et al., 2013). Whereas HPV infections are themselves “asymptomatic and transient” with nearly 70% clearing in the first year of infection and nearly 91% clearing in the second year of infection, high risk strains (16 and 18) parasitically persist longer than normal (Zimmerman, 2006, p. 4813). When HPV infections persist over several years, this can lead into “grade 2 or 3 cervical intraepithelial neoplasia (CIN) and cervical cancer” (ibid).

Two major prophylactic vaccines, Gardasil<sup>®</sup> (latest version: GARDASIL<sup>®</sup>9), manufactured by Merck (CDC, 2010; Kirby, 2015) for females 9-26 years of age to protect against cervical, vulvar, and vaginal cancers caused by HPV (FDA, 2009) and initially approved by the European Medicine Agency (EMA), and Cervarix<sup>®</sup>, manufactured by GSK for use in females 10 through 25 years (Szarewski, 2010; FDA, 2019) and initially approved by the Belgium Federal Agency for Medicines and Health Products, have been tested and proven effective for immunization against high risk HPV genotype 16 and 18 (Einstein et al., 2009). These vaccines received regulatory approval from the U.S. Food and Drug Administration (FDA) and were endorsed by World Health Organization (WHO) for use globally. Currently, the Chinese biotechnology company, Xiamen Innovax Biotech, has introduced a recombinant bivalent HPV vaccine, Cecolin<sup>®</sup>, which has been approved by China’s National Medical Products Administration and prequalified by the WHO in 2021 (WHO, 2021b). In a study in England, it was discovered that HPV vaccine (Cervarix<sup>®</sup>) offered to girls in grade 8 reduced cervical cancer prevalence by 87% in that cohort (Falcaro, 2021, p. 5). According to the WHO, most people who are actively involved in sexual activity will be infected with HPV at some point in their lives (WHO, 2019). This presents a societal health risk that requires

governmental policy actions to avert needless suffering and risk of death for women because of HPV-associated cervical cancer.

## **1.2 Health equity and HPV vaccine uptake**

Health equity is rooted in distributive justice and fairness and expresses “the principle underlying a commitment to reduce and, ultimately, eliminate disparities in health and in its determinants, including social determinants” (Braveman, 2014, p. 6). By this expression, health equity underlies the “central features of the justice of social arrangement” (Sen, 2002, p. 659), that eliminates “systematic differences” within and among groups (Marmot et al., 2008, p. 1661). Eliminating the systematic differences and barriers that undermine distributive justice, individuals can achieve their optimum health potentials as they have fair and just opportunities to be healthy (Braveman et al., 2018, p. 2). While this is the case, health inequity expresses the differences in health outcomes that “are unnecessary and avoidable” (Marmot et al., 2008, p. 1661). Every individual deserves to experience quality health (i.e., degree of optimum functioning), which is a human desire that must be considered an inalienable legal right. This positioning gains weight under the Charter of the United Nations Universal Declaration of Human Rights, which recognizes the inherent dignity of the human person and “the right to a standard of living adequate for the health and well-being” (Article 25) (United Nations, 1948, p. 4). The International Covenant on Economic, Social and Cultural Rights (ICESCR), equally allude to this legal right to health as the “right of everyone to the enjoyment of the highest attainable standard of physical and mental health” (Article 12) (UN General Assembly, 1966). This means, health equity promotes quality of life, and thus, health outcomes that are inequitable and undermines the quality of life violates the precepts of Article 12 and the inalienable legal right of an individual in alignment with the Charter of the United Nations Universal Declaration of Human Rights.

Equitable access to HPV vaccines is inherently a moral human right issues given the fact that the “vaccines [can potentially] address serious medical, economic, and social challenges arising from cervical cancer in women” and thus, promote quality of life (Sundaram et al., 2020, p. 1837). In a 2012 survey of National HPV vaccine programs in 134 HICs, 74 had a national HPV vaccine program (55%), while in 84 LMICs only 12 had HPV vaccine program (14%) (Gallagher et al., 2018, p. 4764). While this is the case, the authors showed that, in 2012, only 83,073 (14%) cervical cancer cases were reported in HICs while 444,546 (86%) cases were reported for LMICs (ibid). In Africa, it has been reported that only 1-2% of women between the age of 10-20 received HPV vaccination (Zhuang et al., 2019). This data clearly delineates a case of unequal access to HPV vaccine. For example, in Canada, publicly-funded HPV vaccination programs were in effect for all girls in all Canadian provinces and territories in 2007 (Steben, 2008; McClure et al., 2015; Bird et al., 2017; Wyndham-West et al., 2018). In Africa, Rwanda became the first African nation to introduce HPV vaccination nationwide as part of its national immunization program in 2011 (Torres-Rueda et al., 2016, p. 46). However, as of 2019, only 11 (out of 46) sub-Saharan African countries (see Table 1) were identified to have nationwide HPV vaccination programs (Black & Richmond, 2018; Ngune et al., 2020; Sayinzoga et al., 2020). Unequal access to HPV vaccines between socioeconomic regions can be equated to unfairness. The unfairness arises from the fact that while LMICs carry the highest burden of the HPV-related cervical cancer cases, there is higher availability and accessibility to HPV vaccine in many HICs compared to LMICs, thus increasingly centralizing the disease in LMICs rather than leveling off towards elimination.

**Table 1: Sub-Saharan African countries with HPV vaccination program**

Country	Year	Delivery	Coverage (year)
Rwanda	2011	School-based (grade 6) and out-of-school girls	93.23% (2011) <sup>2</sup> , 98.7% (2014) <sup>3</sup> , 94% (2017) <sup>4</sup>
Lesotho	2012	School-based	-
South Africa	2014	School-based (grade 4)	HPV1 92% HPV2 72% (2014) <sup>2</sup>
Uganda	2015	National Expanded Program on Immunization	-
Seychelles	2014	School-based (grade 6)	HPV1 77% HPV2 76% (2014) <sup>2</sup>
Botswana	2015	School-based (grades 5–7) and out-of-school girls aged 9–13	-
Uganda	2015	School-based (grade 4) and out-of-school girls aged 10	-
Mauritius	2016	School-based (grade 5)	-
Ethiopia	2018	School-based (target 14 years)	-
Senegal	2018	School-based (grade 9)	-
Kenya	2019	Administered to 10-year-old girls (target population 9–14 years)	-
Côte d’Ivoire	2019	9-year-old girls	HPV 34% HPV241% (2019) <sup>5</sup>

As of March 2022, it is reported that about 117 countries globally have some form of nationwide HPV vaccination program, majority of which are in HICs (WHO, 2022a, p. 2). The Director General of the WHO, in consultation with Member States, committed to mobilize political will to tackle cervical cancer during the 144<sup>th</sup> session of the Executive Board in January 2019, through a Global Strategy towards the Elimination of Cervical Cancer by 2030 (WHO, 2019, 2020). According to the WHO, elimination as a public health problem is defined “by achievement of measurable global targets set by WHO in relation to a specific disease” (WHO, 2016, p. 1). When it comes to cervical cancer elimination, the WHO seeks to bring the cervical cancer incidence rate below 4 cases per 100,000 women-years (Lehtinen et al., 2019; Sundström & Elfström, 2020). To achieve this goal, the WHO recommend that “all countries must reduce cervical cancer incidence below a defined threshold” (WHO, 2019, p. 2) listed below:

- 90% of girls fully vaccinated with a HPV vaccine by 15 years of age;

<sup>2</sup> (Binagwaho et al., 2012)

<sup>3</sup> (Black & Richmond, 2018)

<sup>4</sup> (Sayinzoga et al., 2020)

<sup>5</sup> Côte d’Ivoire, accessed on 21/08/23 at [https://hpvcentre.net/statistics/reports/CIV\\_FS.pdf?t=1692670200339](https://hpvcentre.net/statistics/reports/CIV_FS.pdf?t=1692670200339)

- 70% of women screened [for precancerous lesion] using a high-performance test by 35 and 45 years of age;
- 90% of women identified with cervical disease are treated

According to the WHO, this approach could reduce cervical cancer death by 10% by 2030 globally (ibid). Whereas in some jurisdictions HPV vaccination for males is on the rise, vaccination for female adolescents has been touted as most cost effective and because females are more unduly affected by HPV health effects, high vaccine coverage among females promises herd immunity for heterosexual males (Drolet et al., 2015; Brisson et al., 2016; Sundaram et al., 2020).

### **1.3 Research problem statement**

Even though cervical cancer remains a life-threatening disease globally, vaccination against high-risk HPV strains (16 and 18) have prophylactically helped in preventing the disease. While many HICs have explored and incorporated HPV vaccination in their healthcare programs (e.g., national immunization), it is not the case in most low-income settings – especially in Africa. Inadequate vaccine access in LMICs is further exacerbated by limited or unavailable universal access to primary healthcare (Iwu et al., 2019), preventing opportunities for cervical cancer screening as a secondary prevention strategy as occurs in HICs (Ebell et al., 2018).

The availability of HPV vaccines in HICs has been successful mostly through responsive governmental priority settings (Steben, 2008; Binagwaho et al., 2012; Brotherton et al., 2016; Shapiro, Guichon, & Kelaher, 2017). This is not the case in low-income settings like Africa. For example, in a comprehensive epidemiological review of cervical cancer disease burden in sub-Saharan Africa, the authors noted that the extent of the cervical cancer problem in Africa has been “under-recognized and underprioritized” (Louie et al., 2009, p.1287). This is in comparison to other high mortality diseases such as HIV/AIDS, tuberculosis, and malaria; a plague for the African continent. While some African countries have taken initiatives and programs to promote awareness and to introduce HPV vaccine to their citizens (Binagwaho et al., 2012; Black & Richmond, 2018;



Brotherton et al., 2014; Mapanga et al., 2019; Wigle et al., 2013), this has been challenged with program and policy inertia due to various factors that hinder HPV vaccine uptake and coverage. For example, Dutta and colleagues have pointed to the lack of resources to finance and deploy the vaccines as a major barrier (Dutta et al., 2018, p. 73). In the extant literature on vaccine/medicine access, cost remains a dominant indicator of who gets access, especially in low-income settings (Pogge et al., 2010; Grover et al., 2012; Danzon et al., 2015; Wirtz et al., 2017). While factors such as cost of vaccine and resource allocation for this have been cited in LMICs as a drawback to the vaccine's access in the region, this is not the case in HICs. In 2015, Gavi targeted to make 1 million HPV vaccines available to girls in resource poor settings. While Gavi succeeded in this endeavour, it has stated that the set target of reaching 30 million girls with HPV vaccines by 2030 may not be possible due to supply challenges (GAVI, 2019).

#### **1.4 Situational context in Canada, Rwanda, and Ghana**

##### **1.4.1 Canada**

According to the Public Health Agency of Canada (PHAC), cervical cancer is responsible for 1.3% of all new female cancer cases in Canada (Public Health Agency of Canada, 2017). PHAC reported that cervical cancer accounts for 1.1% of all female cancer deaths in Canada (ibid); and it ranks as the 14<sup>th</sup> leading cause of female cancer in Canada and the 4<sup>th</sup> most common female cancer in women aged 15 to 44 years (Bruni et al., 2023a, p. 9). The 2023 HPV Information Center report for Canada indicate that 16.3 million women over the age of 14 years are at risk of cervical cancer, and estimate the annual number of cervical cancer cases around 1,422 and 637 deaths (Bruni et al., 2023a, pp. iv–5).

Canada is one of the first Organisation for Economic Co-operation and Development (OECD) countries that had some of its provinces and territories introduced HPV vaccination early through its national immunization program in 2007. Also, Canada has universal primary healthcare

with cervical cancer screening every 2 years for women of reproductive age. The introduction of the HPV vaccination program in addition to the existing cervical cancer preventive programs, such as screening, has significantly reduced cervical cancer in Canada (Steben et al., 2018; Goyette et al., 2021).

#### **1.4.2 Rwanda**

In Rwanda, cervical cancer ranks as the 2<sup>nd</sup> leading cause of female cancer and the 1<sup>st</sup> most common female cancer in women aged 15 to 44 years (Bruni et al., 2019, 2023b). The 2023 HPV Information Center report for Rwanda indicate that nearly 4.35 million women over the age of 14 years are at risk of cervical cancer, estimating the annual diagnosed cases around 1,229 and 829 deaths (Bruni et al., 2023b, pp. iv–15). With the high prevalence of cervical cancer in the country, the government placed a high priority on cervical cancer prevention and control through an expansive nationwide HPV vaccination program since 2011 (Binagwaho et al., 2011, 2012, 2013).

Rwanda's resilience to overcome its past genocide history, crumbling healthcare prior to 1995, and economic setbacks to become the first African nation to initiate a national HPV vaccination program is commendable. The Rwandan HPV vaccination program provides some lessons for other African nations, particularly those that have yet to incorporate HPV vaccination into their national immunization program, to learn from.

#### **1.4.3 Ghana**

In Ghana, cervical cancer is the 2<sup>nd</sup> most common cancer among women, however, it is least prioritized by government for intervention (Binka et al., 2017; 1 Bruni et al., 2023; Nartey et al., 2017). The 2023 HPV Information Center report for Ghana indicate that nearly 10.6 million women over the age of 14 years are at risk of cervical cancer, estimating annual diagnosed cases of cervical cancer around 2,797 and 1,699 deaths (Bruni et al., 2023, pp. iv–16). Cases of cervical

cancer in Ghana continue to rise (Binka et al., 2017; Nartey et al., 2017; Awua & Doe, 2018; Awua et al., 2020).

While Ghana has a blanket policy for cancer, which covers cervical cancer, it does not yet have a specific policy governing the prevention and control of the disease. The high incidence of cervical cancer in Ghana, inadequate public knowledge about the disease and HPV infection and vaccination, and low governmental priority setting to deal with the disease despite Ghana's eligibility to receive assistance for HPV vaccine purchasing/vaccination program from Gavi means Ghana provides a compelling case in need of study.

### **1.5 Bridging the policy gap**

Cervical cancer mortality in Canada is low, reducing in Rwanda, however, increasing in Ghana. The lowering mortality rates in Canada and Rwanda may have a link to effective prevention and control policy and programs. Cervical cancer prioritization or enhanced primary healthcare would enable addressing it as a policy gap.

Currently, Ghana does not have an explicit cervical cancer policy even though it has one of the highest prevalence of cervical cancer cases in Africa. The effect of this is indicative in the country's reportedly "very low" HPV vaccination uptake (Asare et al., 2020, p. 1). The closest to a prevention and control of cervical cancer policy that Ghana has is "embedded in other disease-focused plans" (Dutta et al., 2018, p. 74). As pointed out by Brandt and colleagues, "[t]o accelerate uptake of HPV vaccination, policy remains a largely untapped tool" (Brandt et al., 2016, p. 1625). This means policymakers must use policy as the driver to accelerate HPV vaccination. The authors recommend that "[m]ore research is needed to better understand opportunities for policy interventions and the implementation process" (ibid).

## **1.6 Research objectives**

The objective of this research is to provide a deeper understanding of the policy environment within which HPV vaccine access and uptake in Rwanda and Canada operate in comparison to Ghana, and how the policy instruments that are in place engage or disengage the markers of health inequity as far as the human right to health is concerned.

## **1.7 Research question**

According to Awua and Doe, the problem of rising cases of HPV related cervical cancer “necessitate the development and implementation of a cervical cancer prevention and control plan and/or programme for Ghana” (Awua & Doe, 2018, p. 1).

To understand the policy environment within which HPV vaccine and cervical cancer policymaking is formulated and organized for implementation, I seek to answer the question: how are some countries successful in making HPV vaccines readily accessible and available to their citizens while others fail to do so?

As a second question to inform how the policymaking process concerning HPV vaccination, especially for countries that are attempting to roll out nationwide HPV vaccination programs, I take Ghana as a case study and seek to answer the question: why has the government in Ghana delayed or stalled the implementation of HPV vaccine policy to prevent morbidity and mortality of women? This second question highlights the government’s obligation to realize citizens’ right to health. The International Covenant on Economic, Social and Cultural Rights (ICESCR) speaks to the legitimacy of health as a fundamental human right towards the enjoyment of the highest attainable standard of physical and mental health (Article 12) (UN General Assembly, 1966). Ghana is a State party to the ICESCR, signing and ratifying it on 7 September 2000. As a signatory, Ghana commits to protecting citizens’ right to health as a fundamental human right.

## **1.8 Research scope**

The scope of this research is to comparatively delineate the policy dynamic in HPV vaccine policymaking process in Canada, Rwanda, and Ghana and identify aspects that guide governmental priority settings in making available life-saving HPV vaccines to citizens in the various countries.

## **1.9 What the research seeks to inform**

The findings from this study may provide or reveal new perspectives of the internal and external factors that shape HPV vaccine access while indicating missing policy links that could hinder effective or constructive policymaking opportunities. It is expected that the research may be able to lay or relay some foundations that will be needed to address the inequities undermining or preventing HPV vaccine access and coverage in Ghana and other countries in the sub-Saharan region. This can also aid in establishing variables that set the conditions to identified inequities in population health and provide tools to aid in the policymaking processes. As a secondary outcome, the study could also showcase the politicization and prioritization of women's health in Ghana in comparison with Rwanda and Canada.

## **1.10 Research relevance**

The research is expected to identify areas of policy convergence and/or divergence among the three countries compared (Canada, Rwanda, Ghana), reveal governmental priority and agenda settings for HPV vaccine uptake and policy/program, and illuminate the process of policy development including identification of the core actors inside and outside of government and their influence on HPV vaccine access and availability as well as how the inactions/actions of governments could create health inequity/equity in society.

### **1.11 Research guiding hypothesis**

The HPV vaccine access problem in LMICs is a direct health inequity problem and a potential threat to a fundamental human right.

### **1.12 My motivation for this research**

Growing up in Ghana, I had the privilege of having several women mothering me. I saw some of these women, almost all of whom were illiterate, go through unnecessary health-related suffering such as cervical cancer and breast cancer, simply because the government had no effective measures or had inadequate resources to address these prevailing public health problems. I have three sisters and two nieces who are less than 5 years old living in Ghana, and a daughter who is 14 years old, living in Canada. My daughter may not struggle to have access to HPV vaccine, unlike her cousins or even her aunties in Ghana. This is because the Canadian provincial and territorial HPV vaccination program that serves all female adolescents allows her to be vaccinated in a timely fashion. Everyone deserves a right to health and people should not go through needless suffering when a means of prevention is available. Through proactive policy that is backed by financial and logistical resources for implementation, health equity in the context of HPV vaccination can be achieved. The ripple effects of this, as an upshot, can lead to global health promotion.

### **1.13 Research methodology**

I focused on the policy environment within which HPV vaccine access and uptake in the three countries is organized and deployed. The situation in Ghana was compared to Rwanda and Canada, using primary and secondary sources. Primary sources were used to gather data in Ghana and Rwanda, including semi-structured key informant interviews (with policy makers, scholars working on HPV, HPV vaccine experts, health advocacy groups/NGOs, and physicians), as well as an on-line survey (for the public) that was administered. Secondary sources were gathered from academic and gray literature documents for analysis. The Canadian context was analyzed mainly through

secondary data using peer-reviewed journals, grey literature, government documents and website information.

#### **1.14 Rationale for comparing Canada, Rwanda, and Ghana for the study**

The United Nation's Sustainable Development Goals (SDGs) target 3.8 mandates Member States (which includes Canada, Rwanda, and Ghana):

“to achieve universal health coverage (UHC), including financial risk protection, access to quality essential healthcare services, and access to safe, effective, quality, and affordable essential medicines and vaccines for all” by 2030 (WHO, 2021a).

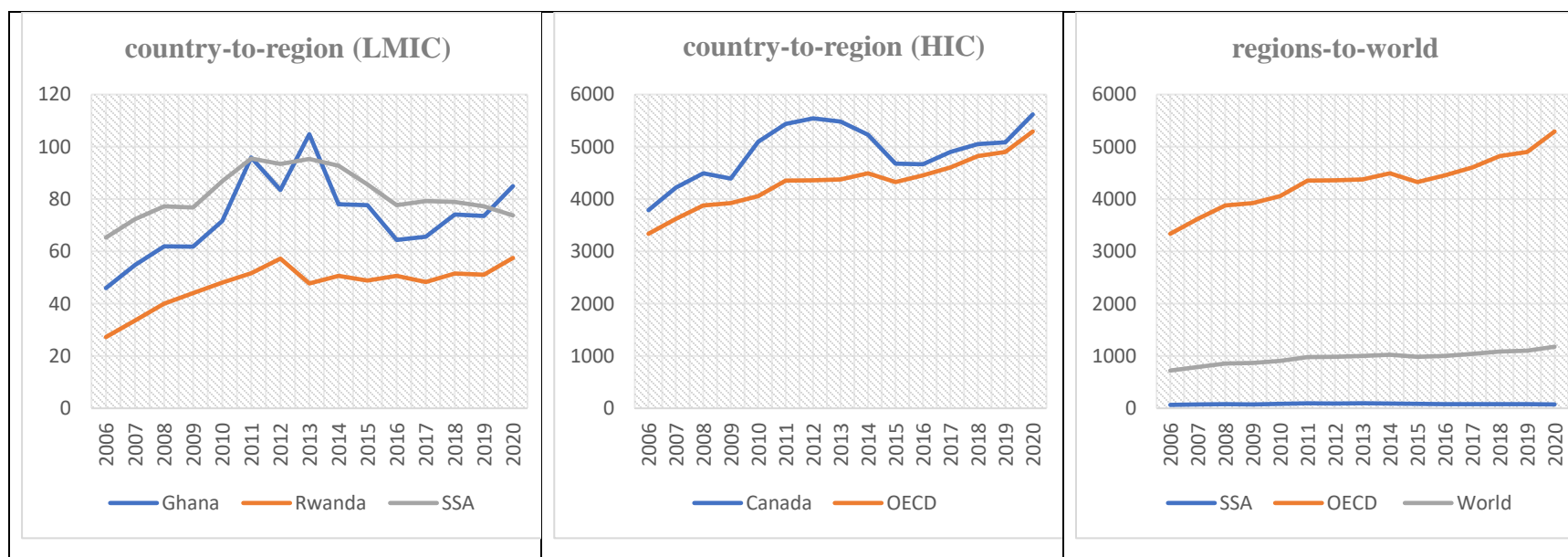
Canada, Rwanda, and Ghana have various means to access HPV vaccines. Rwanda and Ghana, for example, can access HPV vaccines through Gavi-assisted programs. Canadian provinces/territories can access HPV vaccines with assistance from the federal government. All three nations (Canada, Rwanda, and Ghana) have some form of national health insurance scheme and subscribe to WHO's ideal of universal health coverage, which is predicated on equity, quality of healthcare, and provides financial and social risk protection to health seeking recipients (Wong, 2015; Ghebreyesus, 2017; Amu et al., 2018; Chemouni, 2018; Binagwaho & Ghebreyesus, 2019).

According to the World Bank database on health expenditure, Ghana has maintained nearly the average health expenditure per capita of the sub-Saharan African Region between 2006 to 2020, while Rwanda spends relatively lower for the same period (see Table 2). For the same period, OECD nations (which includes Canada) spend significantly higher levels of health expenditure per capita (see Table 2).

**Table 2: Health expenditure per capita (in USD)<sup>6</sup>**

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Ghana	45.96	54.76	61.91	61.81	71.61	95.87	83.49	104.81	78.04	77.74	64.43	65.57	74.13	73.52	84.98
Rwanda	27.24	33.58	40.05	44.08	48.025	51.65	57.22	47.71	50.62	48.81	50.70	48.34	51.54	51.08	57.50
SSA	65.29	72.37	77.27	76.76	86.87	95.51	93.46	95.38	92.77	85.57	77.67	79.23	78.87	77.22	73.74
Canada	3788.69	4221.93	4491.23	4392.14	5096.12	5437.85	5541.58	5484.81	5231.95	4679.98	4668.24	4900.67	5052.68	5083.73	5619.42
OECD	3337.29	3622.39	3880.58	3925.69	4055.33	4351.09	4357.86	4377.70	4494.73	4327.96	4455.82	4602.76	4821.23	4900.27	5292.58
World	721.98	790.29	856.84	867.89	904.96	978.75	987.24	1001.68	1024.92	982.14	1002.80	1041.80	1086.72	1103.03	1177.15

**Figure 1: Health expenditure per capita from 2006-2020**



<sup>6</sup> Source of dataset: The World Bank. Current Health Expenditure. [https://data.worldbank.org/indicator/SH.XPD.CHEX.PC.CD?end=2021&most\\_recent\\_year\\_desc=false&start=2000](https://data.worldbank.org/indicator/SH.XPD.CHEX.PC.CD?end=2021&most_recent_year_desc=false&start=2000) . Accessed on 06/12/2023



The data in Table 2 shows that Ghana and Rwanda spend just around the SSA baseline expectation, which by itself is significantly lower than the global expectation. While this is the case, Ghana consistently shows high health expenditure in comparison to Rwanda (see Figure 1). Canada, on the other hand, consistently invests more in health per capita compared to the OECD baseline (see Figure 1). Despite Rwanda's low health expenditure per capita compared to Ghana, the country became the first in the sub-Saharan region to implement a nationwide HPV vaccination program as part of its strategy to eliminate cervical cancer. A comparison of these countries will reveal the dynamics of political will amidst resource constraints and how health policy decisions are made in the interest or disinterest of the population.

While the health policymaking process in Canada is more mature and thus may present a different context when compared with SSA nation(s), in the light of the wide economic, social and political differences, HPV vaccination in Canada (Bird et al., 2017; Goyette et al., 2021) and that of Rwanda (Binagwaho et al., 2012; Sayinzoga et al., 2020) reflect high coverage rates. This success may present a premise for policy intersection or departure that could be instrumental in identifying a policy knowledge gap(s) or lesson(s) for policy development. This may be something from which Ghana and other SSA countries attempting to implement an HPV vaccination program can benefit. The Ghana National Health Insurance Scheme (NHIS) came into effect in 2004 under the National Health Insurance Act of August 2003 (Agyepong & Adjei, 2008; Blanchet et al., 2012). Although Ghana remains a high-risk nation for HPV related cervical cancer (Binka et al., 2017; Nartey et al., 2017), a low level of government support/interest is apparent when it comes to cervical cancer prevention and control. Asare and colleagues note that “studies specifically identifying challenges to facilitators of HPV vaccination in Ghana are relatively rare” (Asare et al., 2020, p. 2).

The Rwandan Community-Based Health Insurance (CBHI), a pillar of the country's framework to attaining universal health coverage, covers over "three-quarters of the population" and records the highest enrollment in health insurance in sub-Saharan Africa (Chemouni, 2018, p. 87). Rwanda currently is considered high-medium risk with high HPV vaccine uptake as a result of a proactive governmental prioritization of cervical cancer in its public health policy (Binagwaho et al., 2011b, 2012; Black & Richmond, 2018). Canada is one of the OECD countries with a successful HPV program across the province and territories (relatively low risk, high governmental ownership) (Public Health Agency of Canada, 2017; Shapiro et al., 2017).

Canada is selected for this comparative study because the Canadian HPV policymaking process had a relatively stable policymaking environment (Mah et al., 2011; Wyndham-West et al., 2018). This is unlike the case in the U.S or some other OECD countries where the HPV policymaking process was encumbered with controversies from government and non-government actors (Wailoo et al., 2010; Mah et al., 2011; Abiola et al., 2013; Brandt et al., 2016). Ghana (Agyepong & Adjei, 2008; Kusi-Ampofo et al., 2015) and Rwanda (Torres-Rueda et al., 2016; Chemouni, 2018), tend to have a relatively stable policymaking environment, similar socioeconomic and cultural traditions that present favorable conditions to compare the policymaking process in these countries.

## **1.15 Approach for country specific case composition**

### ***1.15.1 Canada***

The Canadian HPV vaccine policy case is well established in the literature (Walhart, 2013; Shapiro et al., 2017; Wyndham-West et al., 2018). The data from citable sources on the Canadian HPV vaccination program, with particular focus on Ontario, will be used to delineate the Canadian HPV policy case. While Ontario was prominently referenced in the Wyndham-West et al. research, related policy case studies from other provinces (e.g., Prince Edward Island and Alberta) are used to support the Canadian case, where necessary.

### ***1.15.2 Rwanda***

In Rwanda, cohesive support from the Rwandan government, the pharmaceutical company (Merck), Gavi, and other stakeholders who worked in alignment with the country's health policy program to control and prevent cervical cancer is acknowledged (Binagwaho et al., 2011, 2012, 2013; Gatera et al., 2016). Government documents, primary data from interview sources, and secondary data from literature will be used to describe and interpret the Rwandan case. Primary sources of information are considered helpful for the Rwandan case, as they could provide meaningful insights into the HPV vaccine decision-making process in the country where the literature misses these opportunities.

### ***1.15.3 Ghana***

Generally, the public health policymaking process in Ghana has been well expanded on in the literature (Reichenbach, 2002; Seddoh & Akor, 2012; Kusi-Ampofo et al., 2015). However, the policymaking process specific to cervical cancer prevention and control is scarce and not well developed in the literature. The opportunity to administer questionnaires and conduct interviews with relevant stakeholders whose focus is on cervical cancer prevention is adopted to build a fundamental information frame for this research.

## **1.16 Theoretical frameworks**

Multiple theoretical frameworks are applied to understand and describe the research questions and interpret the data obtained. The rationale for this approach was to allow for conceptual bridging, identifying areas of overlap that ultimately complement each other where necessary to reiterate outcome reliability. If more than one approach is used and produced conflicting outcomes or one approach contradicted another approach, a strategy is adopted where the information produced by each approach was assessed on its own merits to extract all the relevant information that the approaches produce. The point of conflict is assessed objectively to locate possible bias(es) or

flaw(s) in the approaches. Approach(es) that are identified to be biased or flawed are excluded from the study and the data obtained is not used in the analysis. Similarly, in the case of conflicting approaches that presented similar shortcomings, the approaches are not used altogether. In such situations, a different approach that presents no or reasonably less bias or flaws is employed.

The theoretical frameworks considered for building the research perspective, gathering, and analysing the data include:

1. ***Sensemaking***: Applied to understand the fundamental/logical basis that informs decision-making on vaccine acceptance or vaccination program (Weick, 1993; Weick et al., 2005; Rom & Eyal, 2019).
2. ***Multiple Stream Framework***: Applied to clarify the policy-making process around access to HPV vaccine (Kingdon & Stano, 1984; Kingdon, 1995).
3. ***Actor Network Theory***: Applied for description and evaluation of actors in the HPV vaccine and cervical cancer policy milieu (Latour, 1987, 2000).
4. ***Human Rights Framework***: Applied to understand the study problem in terms of the right to health, actors' actions, and responses as it relates to access to vaccines (Mann, 1997; Farmer, 2003; Petersmann, 2008; Friedman & Gostin, 2012).

### **1.17 Outline of chapters**

In chapter 1, I provided a background to the study on why some countries have nationwide HPV vaccination program and others do not. This is framed within the context of priority settings and health equity. the rationale and motivation behind the study and its relevance is also delineated.

In chapter 2, a scoping review was completed to establish HPV vaccine and cervical cancer policy and policy making process research to identify the policymaking gaps in SSA. This was relevant as Rwanda and Ghana fall under the SSA. Chapter 2 has also been published in the *Journal of Cancer Policy*, issue 26, p.100258 (2020). Chapter 3 focuses on a literature review of public

health policy to describe what public health policy constitutes and the consideration of governmental priority settings in alignment with policymaking frameworks, techniques, instruments, and how these parameters work together in developing public health policy. Chapter 4 involves a literature review on political will as a determinant to public health policymaking towards national HPV vaccination programs in HICs and LMICs. Chapter 5 discusses the research methodologies and theoretical frameworks that were used for the research. Chapters 6, 7, and 8, respectively, focus on a case study analysis of Canada, Rwanda, and Ghana, delineating cervical cancer prevention and control policy and policymaking processes and consider the capacity of national HPV vaccination program. Lastly, chapter 9, involves a cross-national comparative analysis of the three country case studies to identify areas of policymaking convergence and divergence and the contributing factors. Research findings on health policymaking that emerged from the three case studies are discussed. Given the strengths and weaknesses of the different models identified, contributing factors for HPV vaccination policy and policymaking process are highlighted.

## 2 Research Gap in HPV Vaccine and Cervical Cancer Policy and Policymaking Process in Sub-Saharan Africa: A Scoping Review<sup>7</sup>

### 2.1 Abstract

**Background:** This scoping review attempts to showcase how much research gap is present in HPV vaccine and cervical cancer policy and /or policymaking process in sub-Saharan Africa.

**Method:** Google Scholar, Cochrane Library database, ProQuest, and PubMed, were accessed in the search for articles that were written in English language from 2006 to 2019, with relevance to HPV vaccine and cervical cancer policy and/or policymaking process in sub-Saharan Africa.

**Findings:** A total of 63 articles (13%) out of 472 articles that were screened met the inclusion criteria for articles that focused on HPV vaccine and cervical cancer policy and policymaking process in sub-Saharan Africa from the databases that were searched. Of the 63 included articles, only 21 had corresponding authors' address in an African country.

**Conclusion:** The low number of acceptable articles and low percentage of corresponding authors in sub-Saharan Africa focusing on HPV vaccine and cervical cancer policy and policy making process present two likely challenges; 1) a lack of HPV vaccine or cervical cancer policy research interest among African authors, and/or, 2) a lack of funding to support HPV vaccine or cervical cancer research in sub-Saharan Africa.

**Key Words:** Human Papillomavirus (HPV), Vaccine, Cervical Cancer, Policy, Policy Making Process, sub-Saharan Africa.

### 2.2 Introduction

Access to medicines has become a mainstay as a human right ideal. While this is the case, vaccine accessibility is “unacceptably low worldwide” especially in low-income countries (Hogerzeil et al., 2013, p. 680). This problem has been noted in the extant literature with numerous calls for policy intervention through political will (Hogerzeil et al., 2006; Moscou et al., 2013; Lexchin, 2016). Even though cervical cancer remains a life-threatening disease globally, screening and vaccination against high risk strains (16 and 18) of Human papillomavirus (HPV) has proven to extend patients life especially in high income nations (Sinanovic et al., 2009; Gollust et al., 2016; Petrosky et al., 2015; Brotherton et al., 2016). This is however not the case in most resource poor

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<sup>7</sup> Chapter is published and citable as Asempah, E. (2020). HPV vaccine and cervical cancer policy and policymaking research interest in sub-Saharan Africa: A scoping review. *Journal of Cancer Policy*, 26, 100258.

nations globally (Binka et al., 2017; Nartey et al., 2017). In a comprehensive epidemiological review of cervical cancer disease burden in sub-Saharan Africa, the authors noted that the extent of the cervical cancer problem in Africa has been “under-recognized and underprioritized” (Louie et al., 2009, p. 1287). This is in comparison to other high mortality diseases such as HIV/AIDS, tuberculosis, and malaria. Dutta and colleagues have pointed to the “lack of resources” as a major barrier to addressing the problem in Africa (Dutta et al., 2018, p. 73). For example, whereas HPV vaccines are available in high income nations, with indications of accessible vaccines for adolescents in these settings, HPV vaccines remains under-supplied in most low-income nations, with cost of manufacturing the vaccine being cited as one of the reasons for this problem (Sipp et al., 2018, p. 1165).

The Global Alliance for Vaccine and Immunization (Gavi), the international organization that spearheads vaccine access in developing nations, has made some inroads in making HPV vaccines available to some developing nations. Despite this interventional mechanisms provided by Gavi, it is reported that the organization is limited in this effort due to the manufacturing cost of HPV vaccines (Clendinen et al., 2016; Sipp et al., 2018). In the extant literature on medicine/vaccine access, cost has become a dominant indicator that determines how and who gets access especially in resource poor regions (Cohen-Kohler et al., 2008; Pogge et al., 2010; Grover et al., 2012; Danzon et al., 2015; Wirtz et al., 2017).

While the cost of manufacturing HPV vaccines has been cited as a reason for its low uptake in many low-income nations, HPV vaccines have been readily available in many high-income nations such as Australia and Canada (Barbaro & Brotherton, 2015; Bird et al., 2017). The availability of HPV vaccines in high-income nations has been successful mostly through proactive public policy and responsive governmental priority settings (Steben, 2008; Brotherton et al., 2014; Shapiro, Guichon, Prue, et al., 2017). Ghana, for example, does not have an explicit cervical cancer

policy, even though it has some kind of cervical cancer prevention and control plan in place that is “embedded in other disease-focused plans” (Dutta et al., 2018, p. 74). It is interesting to know that despite the fact that HPV and cervical cancer cases in Ghana are on the rise, no significant attention from the government is given to the disease (Binka et al., 2017; Nartey et al., 2017). In a recent cross-sectional study of 285 adolescents in Ghana, the authors show that about 91.2% of the participants have not heard of “HPV” while 95.4% have not heard of “HPV vaccination” (Asare et al., 2020, p. 1). Previous studies across the country have reported similar findings (Ziba et al., 2015; Binka et al., 2017; Williams et al., 2018). Such lack of public awareness showcases a corresponding lack of political will to act. Governmental priority setting begins the process of healthcare intervention through policy tools. This approach has been the pathway for developed nations like Canada, Australia, and in the only pacesetter African country, Rwanda, where access to the HPV vaccine has become part of a successful national policy.

### **2.3 HPV vaccine and cervical cancer policy research in sub-Saharan Africa**

In a bibliometric analysis of 1285 published systematic reviews on vaccines and Immunizations in MEDLINE, Embase, Cochrane Library, Scopus, Web of Science, Global Health and PROSPERO International prospective register of systematic reviews, the authors showed that research studies on vaccines in general have peaked over the years from 34 (in 2008) to 322 (in 2016) (Fernandes et al., 2018, pp. 2254–2258). According to these authors, out of the 322-research studies reported as at 2016, 173 (53.7%) were for HPV vaccine research (ibid). This finding is consistent with the works of Finocchiaro-Kessler and colleagues whose work on cervical cancer prevention and treatment established that there has been an increase in HPV research (Finocchiaro-Kessler et al., 2016). While this is the case, less attention is given to HPV policy research. For example, in a bibliometric study of 758 articles from 1999-2008 in PubMed on access to medicine



research, the authors show that only 9 (1.2%) articles focused on policy makers/ policy (Ritz et al., 2010, p. 4).

In a scoping review conducted by Dutta, Meyerson and Agle to establish plans that African countries have in place to address cervical cancer from a public health model perspective, the authors concluded that of the 54 African countries, only 12 (22.2%) had some plans available, and even that, about 8 (69.2%) of the 12 countries plans were ineffective due to expiration (Dutta et al., 2018, p. 73). The authors observed that most of the countries listed as having a cervical cancer prevention plan, had these policies “embedded in other disease-focused plans” (ibid).

Public health problems require public health policy as drivers to engage policymakers and government to meet population health needs. Research in public health policy, especially in Low- and middle-income countries (LMICs) is therefore an imperative task to draw government attention to policy alternatives that promote health outcomes.

#### **2.4 Scoping review rationale**

While research interest in HPV has been shown to be steadily growing globally, the volume of current HPV vaccine and cervical cancer policy research in LMICs, especially in sub-Saharan Africa, where HPV infection prevalence and HPV related mortality such as cervical cancer is highest, has not been well established. For this reason, a scoping review on HPV vaccine and cervical cancer policy and policymaking research in sub-Saharan Africa, as a heuristic process, is needed to estimate the volume of published research. Knowledge of this work is expected to expand a call for increasing research in HPV vaccine and cervical cancer policy research in sub-Saharan African countries. This will serve as a way of providing policymakers with evidence for their decision-making processes to promote HPV vaccine uptake and the overall promotion of population health.

## **2.5 Scoping review as a panoptical overview**

A scoping review provides a panoptical overview of a research area (Levac et al., 2010; Daudt et al., 2013; Pham et al., 2014). According to Arksey and O'Malley, the methodological framework employed in scoping reviews may help researchers to understand the volume of work that has been done in their research area, the nature of the research completed, what research is ongoing, and what are the potential areas of future research (2005). A similar view has been shared by Daudt and colleagues who point out that scoping reviews provide researchers and policy makers the opportunity to identify gaps in research, the types of resources that are available, and new areas of exploration (Daudt et al., 2013). A scoping review is even more relevant when the research area is not well explored (Mays et al., 2001; Levac et al., 2010; Pham et al., 2014).

## **2.6 Methodological framework**

In this scoping review, Arksey and O'Malley's scoping review framework was adopted. This is in consideration of (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data, (5) collating, summarizing and reporting the results (2005).

## **2.7 Research question**

In Africa, HPV vaccine and cervical cancer policy and/or policymaking process seems to lack prioritization. To understand the research gap in the policy ecology of HPV and cervical cancer in sub-Saharan Africa, I ask the question; how much of research work on HPV and cervical cancer policy and policymaking process has been conducted in sub-Saharan Africa?

## **2.8 Identifying relevant studies**

In this scoping review, Google Scholar, Cochrane Library database, ProQuest, and PubMed, were electronically accessed and searched for articles that were written in English language from 2006 to 2019. The search period was from February 17, 2020, to March 03, 2020. A two-stage strategy was employed in completing the search, except for ProQuest database. The first stage was

to determine studies on HPV vaccine policy or policy making studies in sub-Saharan Africa or in an African setting. In all the databases (except for ProQuest), the phrase “HPV Vaccine and health policy-making process in sub-Saharan Africa” was entered in the search engines.

The second stage was to determine studies in cervical cancer policy in sub-Saharan Africa or African settings. The phrase “Cervical Cancer Policy in sub-Saharan Africa” was entered in the search engines of all the databases (except for ProQuest).

The rationale for this strategy was to maximize search results/outputs for studies where cervical cancer policy and HPV vaccine policy and policy making processes in sub-Saharan Africa were the primary objectives. The downside to the multiple stage search strategy is redundancy, as duplicates may be generated from the same database. In the case of ProQuest, by using Boolean search, the two stage phrase words were contemporaneously entered, and the search executed.

## **2.9 Study selection**

### **2.9.1 *Exclusion criteria***

A three-step approach was engaged in the exclusion criteria. Firstly, publications that focused on a specific country or group that is outside of the African continent were excluded (e.g., African American). Secondly, Publications that did not focused on cervical cancer, HPV vaccines, vaccination policy, policymaking, or programs were excluded. Thirdly, articles that did not appear to have relevant key words as extracted from the articles’ abstracts and/or conclusions or had conclusion content that is remote to HPV vaccine policy, cervical cancer policy, or policy making process, were excluded.

### **2.9.2 *Inclusion criteria***

Articles that have the key words, cervical cancer, HPV (or Human papillomavirus), policymaking, decision-making, vaccine, vaccination, sub-Saharan Africa, developing nations, low-middle income countries, world, global, prevention and control, plan, and program, were selected for screening in the first inclusion process. The acceptable screened articles that were

included were tabulated and categorized according to; title of paper, key words listed by authors, author(s), journal, publication year, country of corresponding author, geography of target audience, relevant key words extracted from abstract and/or conclusion (Max 10), and selection rationale.

## **2.10 Charting the data**

The table for included articles (Table 2) was contemporaneously updated for each search and for articles that met the inclusion criteria. Duplicate articles were removed from each database. All articles that were compiled in table 2 for the various databases were scrutinized to ensure all duplicates have been removed.

In Google Scholar, the first stage search strategy retrieved 382 articles while the second stage strategy retrieved 39 articles, leading to a total of 419 retrieved articles. There were two set of duplicate articles in the first and second stage processes that were removed. 389 articles were excluded using the exclusion criteria, thus, leaving 30 articles met the inclusion criteria. Cochrane Library database retrieved only 1 article during the first stage search strategy. The second stage strategy retrieved 6 articles in total, 4 articles came up for Cochrane Review, 1 for Cochrane Protocols (duplicated in first stage process), and 1 for Trial documents. All 4 retrieved Cochrane Review articles did not meet the inclusion criteria and were excluded. The 1 trial document retrieved was also excluded because it is an ongoing study. The 1 retrieved Cochrane Protocol met the inclusion criteria and was thus included. In ProQuest, the two search strategies employed for the search were entered and searched contemporaneously. There were 22 retrieved search results with two duplicate sets of articles which were removed. The number of articles that met the inclusion criteria in ProQuest was 13. In PubMed, the first stage search strategy retrieved 2 articles and the second stage retrieved 116 articles, thus, 118 total articles were retrieved. 28 articles retrieved in PubMed met the acceptance criteria for inclusion. 90 articles were excluded using the exclusion criteria.

**Table 3: Scoping review data tabulation**

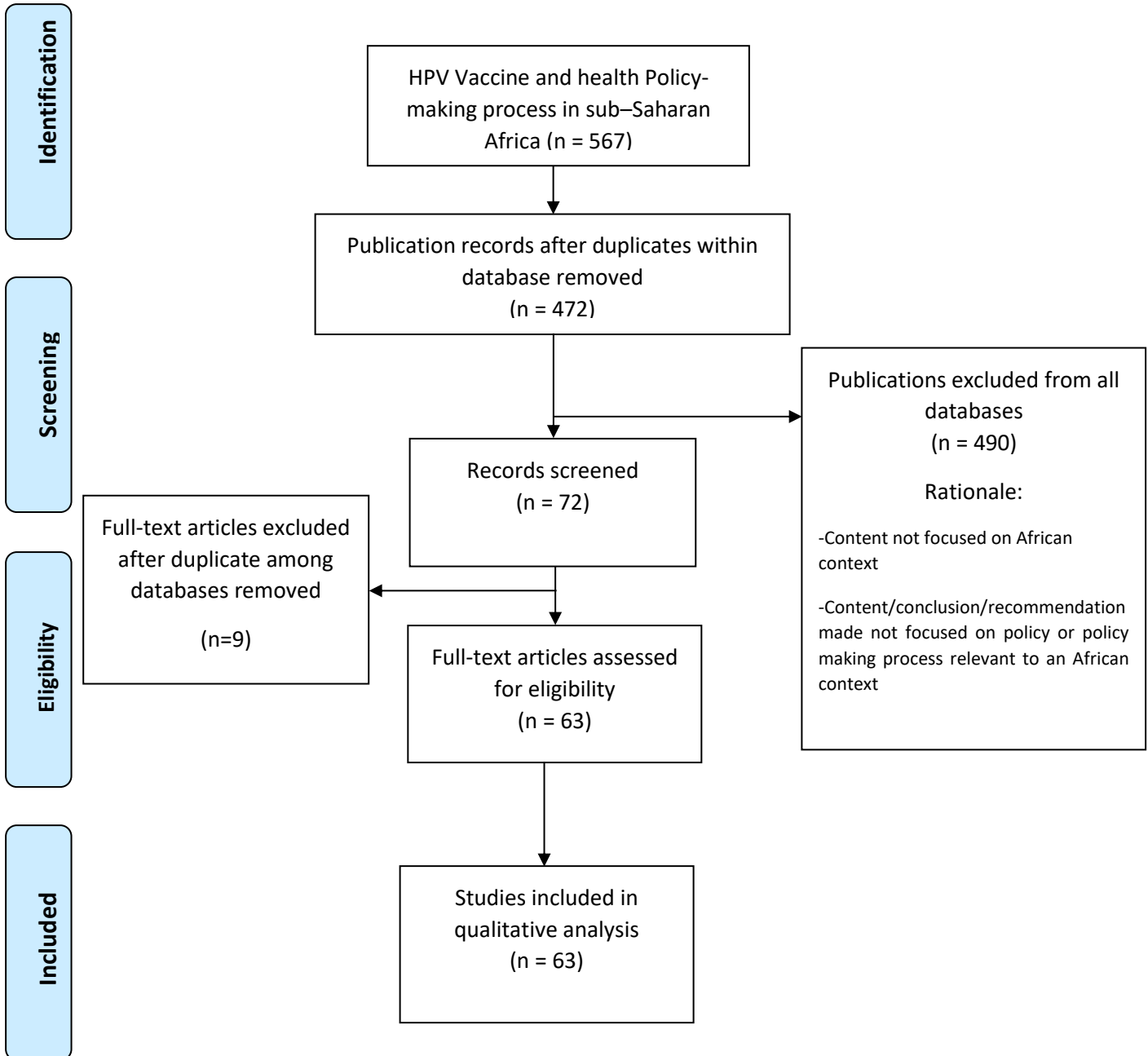
Database	Search Strategy	Duplicates	Articles for Review (TAR-D)	Excluded Articles	Included Articles
Google Scholar	1 <sup>st</sup> = 382 2 <sup>nd</sup> = 39	2	421-2= 419	389	30
Cochrane database	Library 1 <sup>st</sup> = 1 2 <sup>nd</sup> = 6	1	6-1= 5	4	1
ProQuest	1 <sup>st</sup> OR 2 <sup>nd</sup> = 22	2	22-2= 20	7	13
PubMed	1 <sup>st</sup> = 2 2 <sup>nd</sup> = 116	0	28	90	28
Total	567	5	472	490	72

TAR=Total Articles Retrieved; D=Duplicates 1<sup>st</sup>= First Stage

### 2.11 Collating, summarizing, and reporting the results

A total of 567 articles were retrieved during the search in all the four databases considered for this review. Of the total articles retrieved and screened, 72 articles met the initial inclusion criteria. Nine duplicates from the 72 articles were identified among the various databases and were removed, leaving 63 acceptable articles for this review. This represented 13% of the 472 articles considered to have relevance to HPV vaccine and cervical cancer policy and policy making process in sub-Saharan Africa.

**Figure 2: PRISMA for research in HPV vaccine and cervical cancer policy and policymaking process in Africa. a scoping review from Google Scholar, Cochrane Library Database, ProQuest, and PubMed**



PRISMA Chart adopted from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed100009

**Table 4: Articles included in the review of research in HPV vaccine and cervical cancer policy and policymaking process in Africa**

Article Name	Key Words Listed by Author(s)	Author(s)	Journal	Publication Year	Country of Corresponding Author	Geography of Target Audience	Relevant Key Words extracted from Abstract and/or conclusion (Max 10)	Selection Rationale
Essay on politics, public health law, and health outcomes in the United States and sub-Saharan Africa	N/A	Abiola	Harvard University-Dissertation	2011	U.S. A	U.S.A and Africa	Politics, Public Health, Cervical cancer, Sub Saharan Africa, policy, policy making	The political conditions that leads to prioritizing HPV Vaccine
Cervical cancer: the sub-Saharan African perspective	N/A	Anorlu	Reproductive Health Matters	2008	Netherlands	Africa	Cervical cancer, health, sub-Saharan Africa, Priority, appropriate resource	Advocates for governments in sub-Saharan Africa to recognize cervical cancer as a major public health concern.
Integrated Review of Barriers to Cervical Cancer Screening in Sub-Saharan Africa	Barriers, cervical cancer, Pap smear, screening, sub-Saharan Africa	McFarland et al	Journal of Nursing Scholarship	2016	U.S. A	Africa	Cervical cancer, sub-Saharan Africa, policy, interventions, HPV	Study findings revealed barriers to pap smear screening which should be concerning to policy makers
Innovative public-private partnership: a diagonal approach to combating women's cancers in Africa	N/A	Oluwole et al	Bulletin of the World Health Organization	2013	U.S. A	Africa	Sub-Saharan Africa, HPV Vaccine, Policy, policy makers, cervical cancer, GAVI	Advocating Public Private Partnership (PPP) as a step to combat women's cancer in Africa
Assessing the Effectiveness of a Community-Based Sensitization Strategy in Creating Awareness About HPV, Cervical Cancer and HPV Vaccine Among Parents in Northwest Cameroon	Human papilloma virus, Cervical cancer, Vaccine, Awareness, Parents, Cameroon	Wamai et al	Journal of Community Health	2012	U.S. A	Africa	Cervical cancer, HPV Vaccine, sub-Saharan Africa, Awareness	Focuses on parental awareness creation and willingness to vaccinate their daughters
Health systems challenges in cervical cancer prevention program in Malawi	cervical cancer prevention; health system gaps; Malawi	Maseko et al	Global Health Action	2014	Malawi	Africa	Cervical cancer, prevention, policy, treatment, screening	Points to addressing challenges in Malawi's cervical cancer program.
Cervical cancer control and prevention in Malawi: need for policy improvement.	Cervical cancer; cervical cancer control and prevention; policy	Maseko et al	Pan African Medical Journal	2015	Malawi	Africa	Policy, cervical cancer, control and prevention,	Advocate for a standalone policy on cervical cancer control and prevention
Healthcare providers' perspectives on the acceptability and uptake of HPV vaccines in Zimbabwe	Cervical cancer, healthcare Providers, HPV, qualitative Research, sub-Saharan Africa, vaccine	Crann et al	Journal of Psychosomatic Obstetrics & Gynecology	2016	Canada	Africa	Human papillomavirus (HPV) vaccines, polcymakers, solutions, barriers, immunization	Underscores the need for a nationwide HPV immunization program
Comparison of patient flow and provider efficiency of two delivery strategies for HPV-based cervical cancer screening in Western Kenya: a time and motion study	Cervical cancer; HPV testing; time and motion; Kenya; CHCs; Clinics	Olwanda et al	Global Health Action	2018	Kenya	Africa	Policy makers, cervical cancer, screening, prevention,	Findings point to how health systems and program implementers can keep up or scale HPV self-sampling programs in Kenya.
Making Evidence Work for Communities: The Role of Nongovernmental Organizations in Translating Science to Programs	N/A	Kidwell Drake et al	Journal of Women's Health	2010	U.S. A	Global	nongovernmental organizations (NGOs), prevention program, HPV Vaccine, Policy, Priority	Study highlights NGOs as key contributors to inform relevant policy and program design
How Are New Vaccines Prioritized in Low-Income Countries? A Case Study of Human Papilloma Virus Vaccine and Pneumococcal Conjugate Vaccine in Uganda.	Priority Setting, New Vaccines, Human Papilloma Virus (HPV) Vaccine, Pneumococcal Conjugate Vaccine (PCV), Low-Income Countries, Uganda	Wallace & Kapiriri	International Journal Health Policy Management	2017	Canada	Africa	Priority setting, Leadership, program, priority, implementation, vaccine, human papilloma virus (HPV), GAVI, Policy makers, decision making, low-income countries	Point to the prioritization of vaccine within explicit framework that delineates transparency and can trigger political will.
Knowledge, attitudes and practices of young people in Zimbabwe on cervical cancer and HPV, current screening methods and vaccination	Knowledge, Attitude, Young people, Cervical cancer, Zimbabwe	Mapanga et al	Cancer	2019	South Africa	Africa	sub-Saharan African, cervical cancer, prevention and control strategy, HPV vaccination, knowledge	Recommends adoption of cervical cancer policy that is line with WHO coordinated strategy

Article Name	Key Words Listed by Author(s)	Author(s)	Journal	Publication Year	Country of Corresponding Author	Geography of Target Audience	Relevant Key Words extracted from Abstract and/or conclusion (Max 10)	Selection Rationale
HPV prevalence around the time of sexual debut in adolescent girls in Tanzania.	Africa; HPV; adolescent; vaccination	Baisley et al	Sexually Transmitted Infection	2019	U. K	Africa	Prevalence, vaccination, Africa, HPV, Adolescent, vaccine	The aim of the paper was to inform HPV vaccine policy making process
Health professionals' willingness to pay and associated factors for human papilloma virus vaccination to prevent cervical cancer at College of Medicine and Health Sciences University of Gondar, Northwest Ethiopia	Cervical cancer, Human papilloma virus, Willingness to pay, University of Gondar	Tarekegn & Yismaw	BMC Research Notes	2019	Ethiopia	Africa	Cervical cancer, HPV, Policy, policy making, policy	Recommends to policy makers to consider HPV vaccine and awareness creation on cervical cancer
Human papillomavirus vaccination acceptance and hesitancy in South Africa: Research and policy agenda.	N/A	Ngcobo et al	South Africa Medical Journal	2019	South Africa	Africa	HPV vaccine, policy, vaccination	Provides background for LMICs to develop HPV vaccination policies
Patterns and trends of HPV-related cancers other than cervix in South Africa from 1994-2013.	Anogenital, Head and neck, HPV-related, Cancer, Incidence, Mortality, South Africa	Chikandiwa et al	Cancer Epidemiology	2019	South Africa	Africa	HPV Vaccination, policy	Study informs policy direction reduce burden of HPV-related cancers
The impact of the social environment on Zambian cervical cancer prevention practices	Zambia, Cervical Cancer, Screening, Vaccination, Social ecological model, Theory of triadic influence	Nyambe et al	BMC Cancer	2018	Belgium	Africa	Cervical cancer, Screening, advocacy groups, awareness, policy makers, policy, prevention, vaccination, HPV vaccine	Advocates for adequate infrastructure (equipment, institution, capital) to be in place to prevent cervical cancer.
Opportunities and challenges for introducing HPV testing for cervical cancer screening in sub-Saharan Africa.	Cervical cancer screening; East Africa; HPV testing; Low-resource countries	Tsu et al	Preventive Medicine	2018	U.S. A	Africa	Policy makers, HPV vaccine, Screening, cervical cancer	Explored decision making processes for changing screening policy as a measure of prevention and control of cervical cancer
Projected cervical Cancer incidence in Swaziland using three methods and local survey estimates	Cervical cancer incidence, High risk human papillomavirus prevalence modelling, Swaziland	Ginindza & Sartorius	BMC Cancer	2018	U.S. A	Africa	Cervical cancer, policy, decision makers, HPV vaccine, immunization	Study model can be used to inform health policy decision and decision-makers on the allocation of resources towards the prevention and control of cervical cancer.
The next Sub Saharan African epidemic? A case study of the determinants of cervical cancer knowledge and screening in Kenya	Kenya, cervical cancer, screening, wealth-inequalities, socio-ecological framework. multi-level analysis	Kangmennaang et al	Social Science & Medicine	2018	U.S. A	Canada	Cervical cancer, screening, policy, HPV vaccine, policy makers, vaccination	Calls for government policies to enhance capabilities to undertake cancer screening
Cervical Cancer in the Greater Accra and Ashanti Regions of Ghana	N/A	Nartey et al	American Society of Clinical Oncology	2017	New Zealand	Africa	Policy, cervical cancer, prevention and control	The study provides policy makers with information to enable the design policy on cancer prevention and control in Ghana
Cost-effectiveness of Human Papilloma Virus (HPV) vaccination in Nigeria: a decision analysis using pragmatic parameter estimates for cost and programme coverage	Human Papilloma Virus (HPV), Cervical cancer, Vaccine, Screening, Cost-effectiveness-analysis, Expected value of perfect information (EVPI), Nigeria	Ekwunife and Lhachimi	BMC Health Services Research	2017	Germany	Africa	HPV vaccine, cervical cancer, Screening, vaccination,	The paper assess that adoption of HPV vaccination in Nigeria is cost effective. This provides policy makers clear insight in making decision on vaccines
Cost-effectiveness of an HPV self-collection campaign in Uganda: comparing models for delivery of cervical cancer screening in a low-income setting	Cancer, cervical screening, cost-effectiveness analysis, decision making, women's health	Campos et al	Health Policy and Planning,	2017	U.S. A	Low-income setting	Resource utilization, HPV infection, cost effectiveness, cervical cancer, decision making	The paper assess that adoption of HPV vaccination in low-income setting is cost effective. This provides policy makers clear insight in making decision on vaccines



Article Name	Key Words Listed by Author(s)	Author(s)	Journal	Publication Year	Country of Corresponding Author	Geography of Target Audience	Relevant Key Words extracted from Abstract and/or conclusion (Max 10)	Selection Rationale
Using a multimethod approach to develop implementation strategies for a cervical self-sampling program in Kenya.	Cervical cancer screening; Informed decision-making; Multimethod research; Participatory action research; Scenario based planning; Self-sampling	Podolak et al	BMC Health Services Research	2017	Canada	Africa	Cervical cancer, screening,	Study finds there is political will in Kenya to improve cervical cancer screening. The study shows public private partnership is needed
HPV vaccine introduction in Rwanda: Impacts on the broader health system	Adolescent health; HPV; Health systems; Rwanda; Vaccination	Torres-Rueda et al	Sexual and Reproductive Healthcare	2015	U. K	Africa	HPV Vaccine, vaccination, policy,	Rwanda's experience in introducing the HPV vaccine suggests that vaccination campaigns in low-income settings can be rolled out without major negative effects.
Willingness of reproductive-aged women in a Nigerian community to accept human papillomavirus vaccination for their children.	Nigeria; human papillomavirus vaccine; policy; program; women	Morhason-Bello et al	The Journal of Obstetrics and Gynaecology Research	2015	U. K	Africa	Cervical cancer, human papillomavirus vaccine, Nigeria, policy, program,	Article point out parent-centered information by health-care providers and policymakers could potentially increase vaccine uptake
Recommendations for Cervical Cancer Prevention in Sub-Saharan Africa	N/A	Denny et al	Vaccine	2013	South Africa	Africa	Cervical cancer, prevention, sub-Saharan Africa, HPV vaccination	Advocates for African Union to ensure cervical cancer prevention and treatment is incorporated into the African Union Health Strategy
Costs of delivering human papillomavirus vaccination to schoolgirls in Mwanza Region, Tanzania	Africa, costs and cost analysis, economics papillomavirus vaccines, uterine cervical neoplasms	Quentin et al	BMC Medicine	2012	Germany	Africa	HPV, cervical cancer, policy	Study finds it is cost effective for government to introduce vaccine
Health systems and immunization financing for human papillomavirus vaccine introduction in low-resource settings	HPV vaccine Health system Vaccine delivery	Biellik et al	Vaccine	2009	Switzerland	Low-resource setting	HPV Vaccine, Policy, Policy making	Findings suggest low-resource settings are able to adopt HPV vaccine if the health system structures and immunization financing options were well understood
An assessment of the readiness for introduction of the HPV vaccine in Uganda.	Human papillomavirus, vaccine, formative research, cervical cancer, Uganda	Katahoire et al	African Journal of Reproductive Health	2008	Uganda	Africa	Cervical cancer, HPV vaccine,	Study informs vaccine delivery and advocacy strategy
Prevention of cervical cancer	cervical screening and cancer, human papillomavirus infection and vaccination, South Africa	Lynette Denny	international journal on sexual and reproductive health and rights	2006	South Africa	Africa	Cervical cancer, HPV vaccine, Policy,	Study emphasizes on the huge benefit and cost effectiveness of introducing HPV vaccine
The Politics of Priority Setting for Reproductive Health: Breast and Cervical Cancer in Ghana	priority setting measures; women's health policy and programmes; advocacy and political process; global burden of disease; cost-effectiveness analysis; breast cancer; cervical cancer; Ghana	Laura Reichenbach	international journal on sexual and reproductive health and rights	2002	U.S. A	Africa	Policy, priority setting, advocacy, cervical cancer,	Emphasizes on prioritizing cervical cancer in Ghana
Cervical cancer and the global health agenda: Insights from multiple policy-analysis frameworks	cervical cancer; global health policy; policy analysis; non-communicable diseases; priority setting	Parkhursta and Madhulika	Global Public Health	2013	U.S. A	Global	Cervical cancer, priority, advocate, resource mobilize, policy change, policy window	Top-down policy advocacy approach that is salient to cervical cancer policy making process in Africa

Article Name	Key Words Listed by Author(s)	Author(s)	Journal	Publication Year	Country of Corresponding Author	Geography of Target Audience	Relevant Key Words extracted from Abstract and/or conclusion (Max 10)	Selection Rationale
An analysis of key stakeholders' attitudes and beliefs about barriers and facilitating factors in the development of a cervical cancer prevention program in South Africa	cervical cancer prevention, women's health, South Africa	Francis et al	African Journal of Reproductive Health	2013	U.S. A	Africa	Stakeholder; Women's Health, Prevention, Media	A call for all policy players to work towards prevention
Cervical cancer screening and practice in low resource countries: Nigeria as a case study	Cervical cancer screening; human papillomavirus, low resource countries; Nigeria; premalignant disease	Sowemimo et al	Tropical Journal of Obstetrics and Gynaecology	2017	Nigeria	Africa	cervical cancer, screening, treatment, coverage, primary healthcare program	Makes policy suggestion to increase access
African cervical cancer prevention and control plans: A scoping review	Cervical cancer, HPV infection Promotion of health Monitoring and evaluation Primary and secondary prevention Community involvement	Dutta et al.	Journal of Cancer Policy	2018	U.S. A	Africa	cervical cancer prevention and control (CCPC), stakeholders, program, policy, policy processes, health promotion, decision makers, cervical cancer policy, Africa	Makes policy suggestion to increase access
Advocacy, communication, and partnerships: Mobilizing for effective, widespread cervical cancer prevention	Advocacy; Cervical cancer; Communication; Human papillomavirus; Partnership		Int J Gynecol Obstet	2017	U.S. A	Global, Africa	advocacy, communication, intervention, access to prevention, decision-makers, policies	Makes policy suggestion to increase access
Cervical cancer in South Africa: challenges and opportunities	N/A	Tathia et al.	South African Health Review	2013	South Africa	Africa	HPV Vaccine, planning, vaccination strategy, advocacy, resource forecasting, implementation, stakeholders	Assessment of current policy in South Africa
Assessment of the constraints to practice cervical cancer screening among the women of reproductive age in Misau Local Government Area, Bauchi State, Nigeria	Cancer screening, elimination of cervical cancer, policy makers.	Abdullahi	Nigerian Journal for Cancer	2017	Nigeria	Africa	policy makers, cervical cancer, screening, treatment, screening cost, subsidizing	Policy recommendation to subsidize screening cost and treatment
Recommendations for cervical cancer prevention and control in Ghana: public education and human papillomavirus vaccination	Cervical cancer, Education, HPV vaccination, Prevention, Ghana	Nartey et al.	Ghana Medical Journal	2018	Ghana	Africa	government, governmental agencies, stakeholders, cervical cancer, control, prevention, Ghana	Policy recommendation to adopt an integrated approach in controlling and preventing cervical cancer
Health system constraints affecting treatment and care among women with cervical cancer in Harare, Zimbabwe	Cervical cancer, Health system, Constraints, Access, Treatment and care, Sequential explanatory mixed methods, Policies, Harare	Tapera et al	BMC Health Services Research	2019	South Africa	Africa	political will, mobilization, resource, policies, health system, access, treatment	Advocacy for political will and function through policies to address healthcare system challenges that undermine cervical cancer treatment
Towards the development of a community-based model for promoting cervical cancer prevention among Yoruba women in Ibadan Nigeria: application of PEN-3 model	cervical cancer prevention, community-based, PEN-3 model, Yoruba women	Olanlesi-Aliu et al	Southern African Journal of Gynaecological Oncology	2019	South Africa	Africa	cervical cancer, prevention, screening, subsidized cost	Policy recommendation for cervical cancer education and subsidizing screening cost
Capacity building for oncology programmes in sub-Saharan Africa: the Rwanda experience	N/A	Sara Stulac et al	Lancet	2015	U.S. A	Africa, Rwanda	Rwanda, cancer programme development	Citing Rwanda's successful program and recommending replications in other nations
Vaccine strategies: Optimising outcomes	Vaccination, strategy, National Immunization program, coverage, implementation	Hardt et al.	Vaccine	2016	Belgium	Global, Africa	vaccine strategies, government, healthcare organizations, culturally appropriate approaches	Points to evidence of successful vaccine strategies that policy makers can apply

Article Name	Key Words Listed by Author(s)	Author(s)	Journal	Publication Year	Country of Corresponding Author	Geography of Target Audience	Relevant Key Words extracted from Abstract and/or conclusion (Max 10)	Selection Rationale
Vaccines to promote and protect sexual health: Policy challenges and opportunities	Vaccine, Human Papilloma Virus, Sexually Transmitted Infections, Policy, Adolescent, Human Rights	Hawkes et al	Vaccine	2014	U. K	Global, Africa	policy, vaccines, approaches,	Points to policy options that works in HPV vaccine settings
What shapes research impact on policy? Understanding research uptake in sexual and reproductive health policy processes in resource poor contexts	N/A	Sumner et al	Health Research Policy and Systems	2011	U. K	Resource Poor Context, Africa	prospective approaches, policy analysts	A call for prospective approaches in sexual and reproductive health that can receive greater attention from policy analyst
New vaccine adoption: qualitative study of national decision-making processes in seven low- and middle-income countries	Immunization, policy process, qualitative	Burchett et al	Health Policy and Planning	2012	U. K	low- and middle-income countries, Africa	Decisions, vaccines, political, political prioritization, vaccination, burden of disease, vaccine, donor, funding, evidence-informed decision-making	Delineates vaccine policy making process and the challenges
Changing global policy to deliver safe, equitable, and affordable care for women's cancers	N/A	Ginsburg et al,	Lancet	2017	Geneva	Global, Africa	Cancer, global, political priority, policy, cancer control, care	Traces cancer policy for women and raises important reasons for improved control and care.
Rethinking global access to vaccines	N/A	Choskshi	Analysis	2008	U.S. A	low- and middle-income countries, Africa	local, political leadership, prioritize, disease, prevention, vaccination	Point to political leadership about the benefits of vaccine
Conducting Formative Research for HPV Vaccination Program Planning	N/A	Report	PATH.ORG-	2012	U.S. A	low- and middle-income countries, Africa	involve, stakeholders, policy solution, mass media, research briefs	Advocates for top-down stakeholders to work towards providing policy solutions
Promotion of access to essential medicines for non-communicable diseases: practical implications of the UN political declaration	N/A	Hogerzeil et al	Lancet	2013	Australia	Global, Africa	Access to medicine, NCDs, development agenda, priority, action, resources	A call for prioritization of Non-Communicable Diseases (NCD) among policy makers to curb diseases such as cervical cancer.
The sexual and reproductive health of young adolescents in developing countries:	N/A	WHO	WHO	2010	Geneva	Developing Countries	priority (focuses on prioritization of sexual and reproductive health for boys and/or girls under 15 years	A call for prioritization for boys/girls sexual and reproductive health
Role of the private sector in the provision of immunization services in low- and middle-income countries	Immunization, private sector, health financing	Levin & Kaddar	Health Policy and Planning	2011	U.S. A	low- and middle-income countries, Africa	policy, programme setting, immunization, policymaking, coverage, access	makes recommendation for improvement in vaccine uptake
Introducing new vaccines in developing countries	AEFI, developing countries, immunization, vaccines, vaccine introduction, vaccine safety	Kochhar et al	Vaccines	2013	India	Developing Countries	policy advice, planning (delineates strategies for the introduction for new vaccines in developing countries	Provides policy pathway for cervical cancer prevention and control
Identifying and characterising health policy and system-relevant documents in Uganda: a scoping review to develop a framework for the development of a one-stop shop	Evidence-informed policy, Health policy and system documents, Framework, Clearinghouse, Uganda, Low and middle-income countries	Mutatina et al	Health Research Policy and Systems	2017	Uganda	Africa	health policy, priority, mobilising, Uganda, policymakers, decision-makers, stakeholders	Citing Uganda's health policy and policymaking process that shows national health priority setting areas
Cervical cancer: A call for political will	Cervical cancer prevention, HPV vaccine	Pollack et al	International Journal of Gynecology and Obstetrics	2006	U.S. A	Global	Health, advocates, policymakers, political will	Recommends actions plan through political will to eliminate cervical cancer

Article Name	Key Words Listed by Author(s)	Author(s)	Journal	Publication Year	Country of Corresponding Author	Geography of Target Audience	Relevant Key Words extracted from Abstract and/or conclusion (Max 10)	Selection Rationale
What is the “New Public Health”?	New Public Health, Public Health, population health, community health, health promotion, health systems management, diseases prevention	Tulchinsky & Varavikova	Public Health Reviews	2010	Israel	Global, Africa	Approach, human right, health policies, sub-Saharan Africa, political failure	general recommendation to improve public health with no specific threat to cervical cancer or HPV vaccine policy
Human Papillomavirus Prevention Intervention Feasibility Study in Tanzania	N/A	Kabanywany et al	Ifakara Health Institute	2010	Tanzania	Africa	Advocacy, political will, stakeholders, sensitization, awareness, action, plan, budget line, concerted efforts	recommends actions plan through political will to eliminate cervical cancer
Key Prevention and Control Interventions for Reducing Cancer Burden in The Who African Region	N/A	World Health Organization	World Health Organization	2012	Congo	Africa	priority, care, service provision, implementation, surveillance system	A call for cancer prevention and control prioritization
Together on the road to universal health coverage A CALL TO ACTION	N/A	World Health Organization	World Health Organization	2017	Geneva	Global	inequalities, equitable, health services (focuses on universal healthcare and health delivery services)	general recommendation to improve public health with no specific threat to cervical cancer or HPV vaccine policy
Ministry of Health: National Policy Guidelines on Immunization 2013	N/A	Kenya Ministry of Health	Kenya Ministry of Health	2014	Kenya	Kenya	Policy, immunization, vaccination, priorities, Kenyans	Elucidates Kenya's immunization and vaccination priority areas
Women and Health: the key for sustainable development	N/A	Langer et al.	Lancet	2015	U.S. A	Global	fundamental human rights, priorities, public health,	A call for prioritization of women's health as a human right
Factors that influence acceptance of human papillomavirus (HPV) vaccination for adolescents: a qualitative evidence synthesis	N/A	Cooper et al	Cochrane Library	2019	South Africa	Africa	Adolescent, Acceptance of HPV Vaccination, Decision-making arising from parents	Focus is on guardian decision making for their wards

## 2.12 Discussion

This review shows that the percentage of articles that are considered as having relevance to HPV vaccine or vaccination, and/or cervical cancer policy and/or policymaking process in sub-Saharan Africa is low (13%) (63 articles of 472). The review also shows that out of the 63 articles considered, 21(33%) had corresponding authors whose addresses were in Africa, while 41 (65%) of corresponding authors had their addresses in high-income countries. One article, however, had the corresponding author addressed in India (outlier). The low percentage of corresponding authors in Africa could mean two things; 1) a lack of policy research interest among African authors, or 2) a lack of funding to support policy research in cervical cancer or HPV vaccine in Africa.

The lack of policy research interest among African authors is likely because of low visibility that HPV and HPV vaccination receive in the region. This is triggered by a dearth of HPV knowledge among the population in the region. In a systematic review conducted by Perlman and colleagues to estimate the knowledge and awareness of HPV vaccine and acceptability to vaccinate in sub-Saharan Africa, the authors concluded that, “there is an urgent need for more education to inform the public about HPV, HPV vaccine, and cervical cancer, particularly to key demographics, (adolescents, parents and healthcare professionals)” (Perlman et al., 2014, p. e90912). Another potential cause of this may be due to the absence of focused social action groups to make demands on governments for health interventions. For example, in Brazil, the mobilization of its civil groups for social action for the right to health forced the government to take policy actions that led to making relevant HIV/AIDS antiretroviral medicine accessible for all (Galvão, 2005; Parker, 2009; Biehl, 2013). In the case of Brazil, the activities of social groups making demands on governments generated media traction which as a corollary development attracted a vast research interest in the HIV/AIDS policymaking process in that country. In the case of HPV in Africa, the disinterest from many governments in the region to act purposively, coupled with

lax social action groups to demand a right to health from governments inadvertently blurs research interest in the region. Africa has a large presence of community service organizations, local and international non-governmental organizations and some development organizations that seek to drive issues of social concern. The social power that these organizations present individually, and as a group, can make demands on governments for right to health, pushing for policy changes, and advocating for HPV vaccination against cervical cancer. These activities can pique research interest in HPV and HPV vaccination policymaking towards the prevention and control of cervical cancer in the region.

Generally, research funding in LMICs has been narrow and/or low (Head et al., 2016; Grépin et al., 2017; Sam-Agudu et al., 2016; Akuru, 2019). For example, it has been reported that research funding in sub-Saharan Africa has been “overwhelmingly” skewed towards HIV, tuberculosis and malaria mainly because of the dedicated funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria (Kiefer et al., 2017; Moisi et al., 2019, p. 1). In a recent study to access donor funding for health policy and systems research (HPSR) in LMICs, the authors noted that funding in this area has been stagnant and “heavily concentrated among a few donors” (Grépin et al., 2017, p. 6). For these reasons, some researchers in Africa (and other LMICs) opt to apply for research funding in high income countries (HICs) individually (sometimes as a cohort) or collaborate with researchers in HICs where greater opportunities for research funding exist. However, opportunities remain for regional collaboration among researchers in sub-Saharan Africa to harness local funding or resources and leveraging on these to achieve set research goals that can reform policy and influence health outcomes.

### **2.13 Conclusion**

While the trajectory of research in HPV and cervical cancer has been reported to be growing globally, this review indicates that there is a dearth of interest in HPV vaccine and cervical cancer policy and the policymaking process, particularly in sub-Saharan Africa. Whereas sub-Saharan Africa is reported to have the highest prevalence of cervical cancer morbidity and mortality, research in the areas of policy to inform decision-makers on interventional strategies such as HPV vaccination, is low. To the best of my knowledge, this scoping review is the first to be undertaken to assess the level of HPV vaccine and cervical cancer policy and policymaking research interest in the sub-Saharan African region. The review has opened a case of research interest inequity in a disease area where morbidity and mortality rates are high for a disproportionately challenging geographic setting. This is an important observation as it highlights a situation where scholarly policy recommendations on HPV are prominently coming from outside the African region. This problem could lead to blanket policy (generalization) recommendations coming from regions outside the African continent, rather than specific policy (contextualization) recommendations to address the HPV problem in the sub-Saharan Africa region. Targeted funding to promote research interest as a way of locating the internal and external policy factors and/or actors whose actions or inactions affect access to HPV vaccines or cervical cancer control and prevention, is an imperative step to overall public health in the region.

### **2.14 Limitations**

A major limitation to this review is the limited number of databases that were searched. This limitation potentially eliminates articles that could have been included in the review. Further reviews/research that incorporates other databases is recommended to provide firmer knowledge of the gap in HPV vaccine and cervical cancer policy and policymaking process research interest in sub-Saharan Africa. This will minimize the discounting of potential articles that must be

included. Another limitation is that because the review focused on articles published in the English language, relevant articles to this review that were published in other languages and indexed in the databases searched could be discounted. By consideration of these limitations, the findings in this scoping review are considered as estimations rather than confirmations.



### 3 Public health policymaking process

#### 3.1 Abstract

**Background:** The policymaking, governmental priority, and agenda setting process does not happen in vacuum. Many tools, instruments, techniques, and frameworks are interconnectedly used to make public decisions on what governments choose to do or not to do. In this chapter, public health policymaking process is delineated. The factors that work together during public problem framing, policy actor engagement and actor's role, and the factors that aligns to count policy as successful or not successful, are described.

**Methodology:** Literature on public policy, policymaking process, and priority settings formed the backbone for this chapter.

**Findings:** Policy is not made in isolation or a vacuum. Policy is formed once material (*and sometimes immaterial*) actors act or refuse to act. Whatever material actors, such as the government and its agencies, choose to do around a public problem within the policy network at once becomes a public policy.

**Keywords:** policymaking, public health, policy and public problem, policy network, policy entrepreneurs, policy actors, priority settings

#### 3.2 Introduction:

The early pioneers of public health, such as Rudolph Virchow, Edwin Chadwick, and Frederich Engels (Rosen, 2015; Stewart, 2017), and later-day public health influencers, such as Sir Michael Marmot and Paul Farmer (M. G. Marmot et al., 1991; Farmer, 2003), studied various factors of poor health in society, such as poverty, unhealthy social conditions, politics, and analysed population statistical data to determine that poor health is a political condition as much as a social one. This triggered public health advocates to demand from governments the political will to address population health issues by addressing the factors that cause poor health in society.

While health policy may not involve or recognize a government agency as a central actor, public health policy, on the other hand, is government centered and “intersects policy that is health related but impacts the general population” (Porche, 2017, p. 5). According to McLeroy and colleagues, public health policy focuses on strengthening and protection of individual health and population health at large through the use of “regulatory policies, procedures, and laws” (McLeroy

et al., 1988, p. 365). Addressing public health problems requires principled and constituted solutions that come in the form of public policies that governments accept to work with. As noted by Njuguna and colleagues, public health in the grand scheme cannot be effective without policies and countries will not be able to achieve any meaningful public health outcomes “unless the necessary legal and regulatory tools have been developed and implemented” (Njuguna et al., 2020, p. 2). Undeniably, public health policy presents a challenging policymaking route to navigate (Dye, 1992; Dunn, 2015; Kraft & Furlong, 2019). This is because of the complex interaction among policy actors and varied actor-interest that play out at different power brokering levels to determine policy outcomes (De Leeuw et al., 2014; Hunter, 2015; Kickbusch, 2015; Kickbusch et al., 2016). While this is the case, Hodge and colleagues posit that the complex interaction and interplay of engaging various actors within the public policymaking process “are needed to drive change” (Hodge et al., 2020, p. 1).

### **3.3 Understanding policymaking**

Policymaking is a heuristic process of analysis whereby public problems or risk are rigorously assessed to produce prescribed recommendations that are perceived to suppress or remove the public problem (Dye & Dye, 1992; Dunn, 2015; Kraft & Furlong, 2019). The process “determin[es] what would and would not be included as a package” in finding solution to public problem (Gerston, 2014, p. 3). This is dependent on context and is influenced by the positions and relative power that decision makers hold. In effect, the actions or inactions of policymakers coupled with the activities of social processes set the agenda for policy change. While policymaking may consider scientific evidence to propose policy decisions, “the merger of technical evidence, consideration of stakeholders’ values, and political concerns” forms the basis of all policy frameworks (Navaneelan, 2012, p. 35). According to Kingdon, the policymaking process 1) sets the agenda; 2) specifies alternatives for the agenda; 3) provides authoritative

alternatives choices (decision) among many and expressed through legislative enactment or executive decision; and 4) implements the decision policymakers have agreed on (Kingdon, 1995). While policymakers are encumbered with many issues to resolve, they are selective and choose only those problems which, when resolved, will serve their interests. Because of this, policymakers can be deficient in information on a problem and thus can make emotional or instinctual decisions on complex issues that affect society. This can be detrimental to a policy; a policy weakness that opens doors for stakeholder exploitation for self-interest. To mitigate for this weakness, a set of process checks can be introduced into the policymaking process. For this, Polsby proposes that before the agenda setting of the problem, there should be an initiation stage (Polsby, 1985). This stage sets the grounds for problem invention or reinvention, framing, or reframing. At this stage, the problem goes through a process of sifting, winnowing, and separation to provide clear alternatives to policymakers. The initiation stage is set by policy (public) entrepreneurs who serve a two-fold interest: 1) their own interest, and 2) the interest of the promoters for a cause of action prescribed (or proscribed) to be taken by policymakers for change.

### **3.4 Policy and public problem**

Larry Gerston points to public policy as “the combination of basic decisions, commitments, and actions made by those who hold or influence government positions of authority” (Gerston, 2014, p. 7). Every policy recognizes a problem (issue) and underlies a need to change something to correct the problem, therefore prescribes a routine and consistent protocol or actions that are taken to deal with the problem (Bacchi, 2009, 2016; Kraft & Furlong, 2019). The prescribed protocol or actions may be relayed as “statement of intent” to produce a particular outcome(s) to suppress or eliminate the problem(s) (Allsop, 2018, p. 4). This statement of intent is, thus, referred to as policy.

According to Bacchi, public problems, such as health problems, are endogenously created (that is, internally), rather than by outside (exogenous) events, such as the policymaking process, that aims to suggest solutions to the public's problems (Bacchi, 2009, p. x). Public problems are generally complex and nonlinear because they "feed one another", thus creating or attracting different interest groups or stakeholders (Saaty, 1983, p. 140). While this is the case, divergent views and positions of stakeholders on public problems expand the complexity because public problems are perceived differently through different lenses of stakeholders (e.g. social, political, economic, cultural) (Allsop, 2018; Kraft & Furlong, 2019). This leaves room for actors in the policymaking process to interrogate public problems and policy positions that do not align with rational reasoning or promote social intervention reasonably. Such an interrogation process may lead to series of problem framing that can gain strength as more actors support or buy into the framed problem (Bacchi, 2009). By this extension, the problem framing representation of the policymaking process presents a cultural dimension that is revealed by the actions and inactions of the actors. Technically, this is expressed by the position of the actors (Gerston, 2014); how the public problem is situated within the value system of the actors (Kraft & Furlong, 2019). If actor's perception and position on the problem are divergent to the conventionally accepted position, the actor's recommendation(s) will reflect this divergence or value proposition. The greater the influence and buy-ins of this divergent view, the more likely recommendations from this position will be favoured for policy. As Kraft and Furlong point out, "[p]olicies represent which of many different values receive the highest priority in any given decision"(Kraft & Furlong, 2019, p. 6).

### **3.5 Policy actors and dynamics**

#### **3.5.1 Interest groups**

Social problems (e.g., illness) may negatively affect the lives of people by impacting on their quality of life. To make meaning of the impact of the negative social conditions that confront them, people may come together to gain understanding of their situation and “increasingly [become] aware of their shared interests (Walker, 1983, p. 390). According to Walker, if the awareness becomes strong enough, the people may prefer to have a concerted voice by forming an association to represent them (Walker, 1983). These associations or groups become the actors with an interest and can be crucial players in government decision-making process. They represent ideas or positions and influence policy decisions using intrinsic or extrinsic resources (Walker, 1983; Erikson, 2015; Bacchi, 2016). While this is the case, it has been noted actors and the ideas they propose sometimes conflict simultaneously in dynamic ways (Bacchi, 2009, 2016; Erikson, 2015). That is, actors are agents in themselves who articulate ideas for which they are “restricted by the context” of those ideas they propose or champion (Erikson, 2015, p. 452). This conundrum has been noted as an analytical challenge “to capture the interaction between ideas and actors” (ibid). It opens up the objectivity of the human self over “meaning” and how this human objectiveness “can translate human choices into mechanical outcomes without losing the symbolic and emotional processing that is its substance” (Prindle, 2012, p. 37).

Interest groups are very active in the policy process as a way to minimize their “uncertainty” (Richardson, 2000, p. 1008). Richardson notes that to control uncertainties, the activities of interest groups may produce more interest groups and, in the process, rather than reducing the level of uncertainty, the uncertainties are increased (ibid). This is spurred by actors’ aversion to risk and ambiguity that unintendedly undermines priority setting. To gain access to the center of decision making, interest groups either become competitive “to gain access to the policy

making procedure” or cooperative (Jordan & Schubert, 1992, p. 7). They are sometimes referred by some as political “lobbyists” within the political space (Grossman & Helpman, 2001). For this reason (i.e., interest) some have referred to policy entrepreneurs as special interest groups (Maloney et al., 1994; Grossman & Helpman, 2002; Mazey & Richardson, 2006; Singhal, 2008; Petrova, 2012; Halpin & Fraussen, 2017).

### **3.5.2 *Policy entrepreneurs***

Policy entrepreneurs, sometimes interchanged with public entrepreneurs, gained popularity with Kingdon in his multiple stream framework in the mid to late 1980s. In Kingdon’s view, policy entrepreneurs may be, in the long- or short-term range, looking therefore to put their resources where they can have beneficial returns for future policies they subscribe to (Kingdon & Stano, 1984; Kingdon, 1995). Policy entrepreneurs are persuasive, thrive on information, and build networks within government, and among policy stakeholders relevant to their interest. These networks are reserves of vital information that policy entrepreneurs leverage as they participate in policymaking processes. In most cases, policy entrepreneurs are resource rich and stable and may be willing to invest their time and resources in the hope that the return on investment (ROI) in the policy they advocate will be worth the investment. In essence, they are paid practicing service consultants who trade in information, impress on a particular idea(s), propose solutions to problem(s), define/refine policy processes to the advantage of their clients. As noted by Cairney, “[s]omeone needs to speak up for a policy problem in a way that sparks the attention and concern of their audience” (Cairney, 2018, p. 203). Generally, policy entrepreneurs have a stable presence in advanced economies where policymaking processes have been seen as fluid and engaging. For example, Abiola and colleagues noted the role of policy entrepreneurs in the HPV policymaking process in the U.S. and pointed out that they “seemed to make the difference between success and

failure to enact a policy” (Abiola et al., 2013, p. 673). However, a growing presence of local and international policy entrepreneurs are emerging in the political landscape of many LMICs (Sieleunou et al., 2017; Bennett et al., 2018; Prinja & Pandav, 2020; Ng et al., 2021).

### **3.5.3 Policy networks**

Policy networks describe clusters of actors who are commonly interconnected together (either loosely or tightly) by resource dependences in complex networks and interact regularly to share or spread information or engage in collective action to materialize their common interest (Marin & Mayntz, 1991; Rhodes & Marsh, 1992; Peterson, 2003; Dye, 2005). While power can be harnessed in policy networks to influence policy decisions, different layers of networks exist that differ in terms of their ability to influence based on resource capacity, stability, political clout, and membership (Marsh & Rhodes, 1992; Rhodes & Marsh, 1992; Richardson, 2000; Marsh & Smith, 2000). According to Rhodes and Marsh, policy networks operate as buffers between policy communities and issue networks (Rhodes & Marsh, 1992; Rhodes, 1997).

### **3.5.4 Issue networks**

Issue networks present a policy network structure that is less stable because it lacks the ability to effectively organize resources, are highly fragmented, very open, less organized as a group, with membership commitment and interest changing sporadically over time depending on what policy issue is at stake (Rhodes & Marsh, 1992; Van Waarden, 1992; Rhodes, 1997; Dredge, 2006). They normally have alternative(s) to policy and at times divergent views to public problems due to individual actor-interest and preferences for policy outcomes. The issue networks function to break the policymaking monopoly enjoyed and sustained by the policy community through various means to draw attention to the issue. While this is the case, the disorganization/disjointedness, lack of resources generally, and lack of resources to push forward an agenda through policy networks undermines their effective participation and influence in the

polycymaking process (Rhodes & Marsh, 1992). The inability of issue networks to effectively mobilize to break the monopoly enjoyed by policy communities keeps the policy community largely intact with its configured powers to make public policy.

### **3.5.5 Policy communities**

Governments normally can exercise executive power to influence a policy by choosing one policy option over others presented by policy communities. Policy communities are highly-integrated networks, wherein interactions among members (highly restrictive) is stable and tight-knit, has a large membership that is highly organized and structured, and with “high degree of vertical interdependence”(Rhodes & Marsh, 1992, p. 182). According to Miller and Demir, “[p]olicy communities indicate a policy process in which organized interests and governmental actors play a major role in shaping the direction and outcome of public policies” (Miller & Demir, 2017, p. 137). The flow of decision-making power normally flows from government, to its agencies, to the policy communities, then trickle down to the subgroup networks (Miller & Demir, 2017). It has been noted that government actors, who are the gatekeepers of the policy community, may suggest or enlist actors into the network with an insular objective that is directed towards economic gains (Atkinson & Coleman, 1992; Howlett et al., 2009; Miller & Demir, 2017). This would normally “tighten the monopoly of the policy community”, thus, increasing its stability (Asempah, 2014, p. 21). Distinctively, in policy communities, communication and flow of power is non-hierarchical (Rhodes & Marsh, 1992; Mazey & Richardson, 2006; Miller & Demir, 2017). Because of policy network communities’ closeness to political power and influence, policy communities have been criticized for political appropriation (ibid).



### **3.6 Priority setting and policymaking**

#### **3.6.1 Policy instrument**

Policy instruments are the tools or vehicles which are in place or put in place to make policy work. Policy instruments may be tangible or intangible. For example, evidence-based intervention (Biller-Andorno et al., 2002), information (Orset, 2021), community (Rochefort et al., 1998), performance measurement (Le Galès, 2016), fear (Caplin, 2003), resources of government (e.g. money, rule, and authority) (McDonnell & Elmore, 1987) can become policy instruments because these tools serve as vehicles through which policy may function. Caplin, for example, notes that fear appeals in health communication because it triggers cognitive actions and activates emotional responses to discourage people from engaging in acts that will be detrimental to their health (Caplin, 2003, p. 3). This may arouse awareness, enable vigilance, and arouse danger control, such as prevention. When it comes to government resources as policy instruments, a focus on what government resources should be used and extent of resources must be allocated become critical areas of governmental policy discourse.

### **3.7 Resource allocation and priority setting**

Government resources are never enough considering the ever-rising social and economic needs among populations within and among countries. Inadequate resources make it difficult to provide necessary healthcare intervention to those who need or want it most. This raises questions of health equity grounded in the fact that demand for healthcare outpaces the supply of healthcare resources and systems, especially in many LMICs countries. For this reason, adequate resources must be properly allocated for maximum returns that is fair. It requires a coherently sound framework or process where stakeholders are effectively engaged. While this should be the case, it is noted that “many nations still lack well-defined processes for considering evidence in decision-making” for priority setting (Baltussen et al., 2017, p. 127). While the lack of well-

defined processes present challenges in priority setting, the collection of stakeholder experiences and effective interactions present opportunities to create an *ad hoc* priority setting process in the interim.

Priority setting defines the scope of where resources must be expended, usually for a maximum return either socially or economically. The process can be either implicit (unintended outcomes of actor pressures) or explicit (intended outcomes of actor pressures) (Baltussen et al., 2006, p. 689). While implicit and explicit priority setting processes tend to yield varying outcomes on a priority setting outcome profile, explicit (transparent) priority setting process tend to produce maximum outcomes (Baltussen et al., 2006). Explicit priority setting processes seek a value-driven outcome for resource allocation in a transparent manner. While this is an expectation from explicit priority setting, the process has been found to be more of a mirage. For example, Lindsay and colleagues in their study of seven countries (Israel, Norway, the Netherlands, Sweden, Denmark, New Zealand and the United Kingdom, and one state in the US, Oregon) that are noted for their explicit priority setting approaches to healthcare pointed out that, little to no effect of priority setting on health policy exist, neither has the call for public participation influenced decision making (Sabik & Lie, 2008). This disables the idea of transparency in priority setting and reengages a conventional process of priority setting where decisions are not necessarily equitable but may favour one group over the other. In healthcare, especially in underserved nations, resources are scarce coupled with rising challenges of service demand (Angelis et al., 2017, p. 76). The issue of prioritization of resources and its allocation is thus no easy task due to series of disease areas that compete in parallel for the same scarce resources and varied interest groups involved in allocating resources. When resources are not properly allocated, the result is inequity in health,

subsequently leaving the poor even more exposed to other diseases and further pushing patients and/families of patients into hardship.

The parallel nature of competition for resources sometimes creates room for actor manipulation to favour their course. This means when priority setting for resources are not conducted in fair and transparent manner, the process leads to weakened outcomes that either waste resources or produce sub-optimal programmatic results (Menon et al., 2007; Rumbold et al., 2017; Mullen & Spurgeon, 2018; Kaur et al., 2019). Individuals who make healthcare decisions on how resources should be allocated have to provide a justification for their decision. They cannot make subjective, random, or whimsical decisions without value building or a thorough rationale formalized (Lane et al., 2017). As noted, priority setting is “a value-based political process which takes place in an environment of social values and diverging interests” (Baltussen et al., 2016, p. 615). The process articulates a pluralistic approach in which stakeholders involved may swing between facts, sensemaking, ideas, and beliefs in cognisance of changing political priorities and pressures. Stakeholders here refer to a group, organization, or individual who can affect or is either directly or indirectly affected by the actions of the outcome of a decision-making process and interact/engage with the decision-making process to influence the decisions or actions (Freeman, 2010; Andriof & Waddock, 2017; Freeman et al., 2020).

In a study conducted by Menon and colleagues to assess priority setting process in Alberta, Canada, for example, the authors pointed out four core revolving steps applied in healthcare resource allocation: 1. Identification of healthcare needs, 2. Allocation of resources, 3. Communication of decisions to stakeholders, and 4. Management of feedback from them (Menon et al., 2007). Kaur and colleagues’ systematic review of 112 peer reviewed articles on “criteria used for priority setting for public health resource allocation in low- and middle-income countries”

found that cost-effectiveness was the predictor for decision making on resource allocation (Kaur et al., 2019, p. 3). While cost effectiveness has been predominantly used by many countries in priority setting, gaps in this approach have been identified by some scholars, thus exposing weaknesses in the approach. The approach has been cited for placing emphasis on process efficiency in cost effectiveness (Baltussen et al., 2016, 2017). In a review of decision criteria for resource allocation and healthcare decision making, Guindo and colleagues highlighted the importance of considering two areas of thought in resource allocation: 1) Normative (i.e., asking the question what should be done?), and 2) feasibility (what can be done?) (Guindo et al., 2012). According to the authors, normative considerations highlight the “actual worth or value of healthcare interventions.” Out of ten criteria considered, eight fell under normative: “equity and fairness, efficacy, cost-effectiveness, strength of evidence, safety, mission, and mandate of healthcare system, need, patient-reported outcomes” (Guindo et al., 2012, p. 9). It is important to mention that the normative criteria, “equity and fairness”, is ubiquitous as a consideration factor in several priority setting and tends to provide guidance on how resources are allocated especially in underserved regions (Sabik & Lie, 2008; Guindo et al., 2012; Lane et al., 2017, 2019). The terms equity and fairness, however, have been perceived differently by different stakeholders depending on which ideal or social feedbacks one perceives as equity or fairness. The centrality of this revolves on the principles of distributive justice (Chang, 2002; Braveman & Gruskin, 2003; Braveman, 2014).

The principle of distributive justice on which equity and fairness thrive creates the political, economic, cultural, environmental, and social roadmaps to outline the health problem, locate areas of risk (severity), and understand the occurrences of the factors that causes differences in population health outcomes. For example, it is not uncommon to find decisionmakers prioritising

disease areas that are severe or have a higher mortality rate than those that are less severe or have low mortality. The recent attention given to COVID-19 by the global community and key stakeholders such as WHO, governments, biopharmaceutical industries, and how these stakeholders quickly prioritise and deployed resources to develop vaccines may be indicative of this. Guindo and colleagues in their review noted that the second consideration in priority setting have only two criteria under feasibility consideration, i.e., stakeholder pressures and interests, and organizational requirements and capacity (Guindo et al., 2012, p. 9). The encompassing gain, according to the authors, is to incorporate the two areas of (normative and feasibility) criteria in the process for resource allocation for maximum returns within the realms of efficacy and equity. From the extant literature on the recognition of value-base health outcomes in priority setting, two paramount factors promote and maximize these outcomes: 1) the health-society setup and key stakeholders, and 2) the gain-value paradigm in priority setting process.

1. *The health-society setup and key stakeholders*: The social set-up comprises the patients, the health systems in place and health providers, technologies and health delivery systems, the health policy in place, health education program, and citizen perception or outlook on health. These shape what factors must be considered in outcome optimization during the priority setting process. For example, a consideration of the economic conditions of a society, how individuals in a society take care of their health, extent of resources individuals invest in their health, and what amenities, support, and interventions government makes available to people when it comes to their health should influence priority setting process (Golan et al., 2011; Baltussen et al., 2016).

2. *The gain-value paradigm*: As pointed out by Hofmann, “[t]he rules and regulations for priority setting may not be known, difficult to interpret, disputed, rejected, ignored, or disrupted” (Hofmann, 2020, p. 53). This presents uncertainties in outcomes. To neutralize these challenges

requires constant interaction, stakeholder incentivization, resource shifting, camaraderie and negotiating at different levels to calibrate certainty and success. Also, biases among stakeholders will have to be identified during the priority setting process. Hofmann notes that stakeholder biases held during priority setting leads to “irrationality” (Hofmann, 2020, p. 52). Because of the irrational perspective of stakeholders arising from their biases, this could distort their perception of fact or truth, have unreasonable and illogical interpretation and expectation of the problem, and largely resist positions that are not in alignment with their judgement. This can lead, for example, to biases such as “failure embarrassment effect” where stakeholders are not happy to accept or admit being wrong in their decision making as such challenge values and principles to maintain their social status. When government resources are efficiently used leading to “‘waste’ reduction, cost cutting or more efficient use of available resources” this is taken as a measure of policy success in “contemporary public policies” (Marsh & McConnell, 2010, p. 574).

### **3.8 Policy success and failure**

Policies traverse a continuum (success to failure) and the factors defining the policy outcomes pivot around the actors and their positions on the policy. While this is the case, government is an important determinant of a policy success or failure due to its access to state and some non-state resources to manipulate the outcomes of the policy. By government, reference is made “to the institutions and political processes through which public policy choices are made” (Kraft & Furlong, 2019, p. 7). This means the role of government and the programs it institutes to fix identified public problems is imperative (Bacchi, 2009; Dunn, 2015; Kraft & Furlong, 2019; Allsop, 2018). Thus, governments “ultimately are responsible for governance” (Peterson, 2003, p. 3). From a corporatist perspective, where power predominantly resides with the state, government’s objective in policymaking is to produce policy outcomes that “favour a common

political good” (Jordan & Schubert, 1992, p. 7). While government remains a core actor in the policymaking process, its role has been actively questioned. For example, Dye asks:

“Does the government generally know what it is doing? Generally speaking, no. Even if programs and policies are well organized, efficiently operated, adequately financed, and generally supported by major interest groups, we may still want to ask, So what? Do they work? Do these programs have any beneficial effects on society? Are the effects immediate or long range? Unfortunately, governments have done very little to answer these more basic questions” (Dye, 2005, p. 332).

The political power that governments wield and the fiscal capital and state manpower they can mobilize means government is a critical player in policy failure or success. While this is the case, policy success or failure is regularly contested on context, concept, and content of the policy from the viewpoint of policy evaluators. This arises as policy success or failure becomes socially constructed and politically articulated and can deductively estimate where a policy evaluator sits on the social or political spectrum (Taylor & Ballloch, 2005; Marsh & McConnell, 2010). This evaluation can be perceived from the perspective of policymaking process in the formation of policy choice; programmatic decision of the benefits of the policy to “a particular actor, target group or interest, based on issues such as territory, race, religion and gender”; and the political advantage of the policy to incumbent government (or otherwise) on whether the policy enhances their electoral prospects (Marsh & McConnell, 2010, p. 574). The ontological bias with this type of assessment is that it can mischaracterize unfavourable policies as failures and favourable policies as success and perceive divergent opinions as foes (Marsh & Rhodes, 1992; Marsh & Smith, 2000; Bovens et al., 2006; Marsh & McConnell, 2010). This mischaracterization may be attributable to the irrationality of the public and its link to the problem of expert stakeholder irrationality observed in policy priority setting or policy evaluation (Miller & Demir, 2017; Torgerson, 2017). Another problem that may arise is when government power is fragmented

(pluralist state) and spread across its various agencies and bureaucratic offices. In government where power is fragmented, actor influence in each fragment is not stable, receives fierce or subtle opposition, and the relationship can also create conflicts of interest which as a corollary effect may impact resource allocation and distribution (Kozhikode & Li, 2012, p. 339). This consequentially impacts on the overall success or failure of any policy prescribed. Policy success is not “all or nothing” as “[i]t may achieve some of its objective and not others” (Marsh & McConnell, 2010, p. 577). The success or failure of a policy needs to be seen as two ends of a continuum, as such policy evaluation must be assessed objectively on merits of what it is doing rather than on what it has not stated to do.

### **3.9 Conclusion**

In essence, policymakers are presented with complex routes to navigate policies and slippery slopes to thread because of the many interest groups that shape health policy. This is because of the heterogeneously complex interaction of actors and varied interests that play out at different power levels to determine outcomes. While this is the case, the health policymaking process at the same time presents policymakers with opportunities to “retrospectively and prospectively...understand past policy failures and success and to plan for future policy implementation” (Walt et al., 2008, p. 308).



## 4 Political will as a determinant of public health policymaking: towards nationwide HPV vaccination programs

### 4.1 Abstract

**Background:** Only 25% of countries in resource-constrained regions of the world introduced HPV vaccination into their nationwide immunization program. This is despite the regions carrying the highest burden of HPV-related cervical cancer deaths in the world. Relative to economically rich regions where HPV related cervical cancer mortality is historically low, 85% have nationwide HPV vaccination programs.

**Methodology:** A range of literature on HPV and cervical cancer in HICs and LMICs are reviewed and analysed to distill the cause(s) of why LMICs continue to report low nationwide HPV vaccination rates.

**Findings:** Cost is a highlighted indicator of who gets access to vaccines, especially in resource-constrained settings. However, a few successful nationwide vaccination programs in some LMICs indicate that political will to prioritize cervical cancer elimination and resource allocation makes the difference.

**Conclusion:** The lack of political will to prioritize cervical cancer prevention and control is, by itself, a policy.

**Keywords:** policymaking, political will, priority setting, HPV, vaccination, cervical cancer

### 4.2 Introduction

The WHO has made the recommendation for countries to include HPV vaccination in their national immunization programs provided “prevention of cervical cancer and/or other HPV-related diseases constitutes a public health priority; vaccine introduction is programmatically feasible; sustainable financing can be secured; and the cost-effectiveness of vaccination strategies in the country or region is considered” (WHO, 2014, p. 488). Early sexual debut presents a major causal risk factor for HPV infection (Clark, 2004; Schaefer et al., 2017; Uchudi et al., 2012). According to Mapanga and colleagues, this problem is worsening with a greater portion of young people having “insufficient knowledge about health issues” (Mapanga et al., 2019, p. 2). While the problem requires education and public health actions to change behaviors, young people, especially girls who are at a greater risk of cervical cancer are less likely to access interventions such as HPV vaccination or undergo screening to detect any precancerous lesion and eventual treatment.

Protection against HPV infection through vaccination has proven to be effective at reducing cervical cancer cases. The HPV vaccine retains its prophylactic effectiveness only if vaccination takes place prior to pre-exposure to the virus (CDC, 2010; Einstein et al., 2009; Kirby, 2015; Szarewski, 2010). Thus, to achieve a greater benefit of the vaccine, the target group for vaccination should be adolescents prior to debuting sex. While most adolescents in Africa having no access to the HPV vaccine or get access to the vaccine much later when they may have debuted sex, it is imperative for African governments and policymakers to take action that ensures HPV vaccination becomes a necessary public health package for all adolescent females. This must be a priority public health policy position that the continent must collectively take with the African Union directorate on health spearheading the challenge. Individual countries have a responsibility under the United Nations Universal Declaration of Human Rights to protect the health of their citizens. While this is the case, most African countries prioritize health the least, as showcased with enormous governmental focus on the economy. This neglect leads to poor health system and as a corollary development, health inequity, which “represents a failure on the part of national governments to fulfil their obligations towards their citizens in terms of their right to health” (Cameron et al., 2011, p. 2). When it comes to women’s health, political will is lacking in many LMICs. As Dr. Mahmoud Fathalla point out, “[w]omen are not dying because of diseases we cannot treat. They are dying because societies have yet to make the decision that their lives are worth saving.” (Fathalla, 2006, p. 409).

#### **4.3 Cost effectiveness of HPV vaccination program**

Vaccine cost effectiveness analysis provides governments and policymakers with a rationale to consider a vaccine intervention by adjusting and calibrating the cost of implementing a new vaccination programme “against the societal burden of avoidable morbidity and mortality” (Sundaram et al., 2020, p. 1838). This assessment allows governments to make decisions on

resource allocation based on overarching gains of the vaccine or against other governmental priorities. While vaccine cost effectiveness remains a paramount basis for vaccine decision making process, the extant literature is evidently conclusive that vaccination benefits far outweigh the cost. For example, a cost effectiveness analysis conducted by Olsen and Jepsen on HPV vaccination in Denmark indicates that while HPV vaccination is an added cost to existing cervical cancer prevention strategy, the vaccinations “save treatment costs and improve both quality of life and survival” (Olsen & Jepsen, 2010, p. 190). This is consistent with studies conducted in New Zealand between 2007-2010, which show that when Gardasil<sup>®</sup> (the Quadrivalent HPV vaccine manufactured by Merck) was administered to female patients under 20 years who are diagnosed with genital warts (caused by HPV infection 6 and 11), HPV infection in the target population declined significantly (Oliphant & Perkins, 2011). In Australia, cost effectiveness analysis performed by Kulasingam and colleagues equally pointed out that, the added cost of introducing HPV vaccination to the national immunization program is a “cost-effective way to reduce cervical cancer” (Kulasingam et al., 2007, p. 165).

It has been shown that HPV vaccination of females over 70% coverage before debut sexual encounter is highly cost effective and significantly reduces lifetime risk of cervical cancer. In Kim and colleagues’ cost effectiveness assessment of cervical cancer prevention in sub-Saharan Africa, the authors predicted that over 670,000 total cases of cervical cancer can be averted in sub-Saharan Africa at HPV vaccination rate of 70% coverage and up (Kim et al., 2013, p. F69). Goldie and colleagues performed similar cost effectiveness assessment in LMICs and showed that for a “70% coverage, the mean reduction in the lifetime risk of cancer was reduced by 40–50% in most countries” (Goldie et al., 2008, p. 89). In Brazil, a country with a high cervical cancer burden, HPV vaccination for pre-adolescent girls has been established to be a cost effective strategy and has

been recommended to be “the first priority in reducing cervical cancer mortality” (Kim et al., 2007, p. 1322). Brisson and colleagues’ comparative modelling analysis of 78 LMICs, using the WHO Cervical Cancer Elimination Modelling Consortium (CCEMC), predicted that high HPV vaccination for girls is an interventional strategy that has the possibility of eliminating cervical cancer as a public health problem by the end of the century (Brisson et al., 2020, p. 588). There is no shortage of these types of assessments as they have become indicative that the benefits of introducing HPV vaccination outweighs the immediate investment cost (Ekwunife & Lhachimi, 2017; Moodley et al., 2016; Okeah, 2020; Portnoy et al., 2020; Abbas et al., 2020). It is therefore in the interest of public health policymakers in LMICs to pursue HPV vaccine introduction with the urgency it needs to save the lives of women and promote population health overall.

#### **4.4 Political will and HPV vaccine policy challenges**

Political will is the commitment policy actors make to achieve defined set of policy actions through political behaviors, such as influencing and controlling the actions of other actors, cooperation, and emotional balance (Brinkerhoff, 2000; Mhazo & Maponga, 2022; Post et al., 2010; Treadway et al., 2005). This requires intrinsic or extrinsic motivation of actors to drive the need to achieve the desired policy action(s) through tangible (e.g., humans and money) and intangible (e.g. ideas and intents) resource organization (Brinkerhoff, 2010; Post et al., 2010). While the actions of actors shapes political will, it is noted that in some instances this is motivated by an actor’s desire for power and control (Machiavellianism) and sometimes the lack of personal power, all of which can lead to manipulation (Brinkerhoff, 2010; Mhazo & Maponga, 2022; Emphasis: Treadway et al., 2005, p. 231). With this motivation at play, political will mobilizes resources and drives policy actions that are perceived to change or resolve a public problem. Thus, political will can be perceived as the cord that binds politics and policy together to solve a public problem.

Even though Gavi remains committed to supporting LMICs in their efforts to prevent cervical cancer through financial support in purchasing vaccines, a series of challenges are encountered (Coleman et al., 2011; Black & Richmond, 2018). Black and Richmond, for example, pointed out that in Uganda the past two decades up to 2018 has seen increase in cervical cancer prevalence with annual incidence rate increment from 80 to 180 cases per 100,000 women from 1993 to 2007 (Black & Richmond, 2018, p. 2). One of the reasons for the rising cases in Uganda has been that most women do not have access to healthcare services to screen for early detection (Wabinga et al., 2000; Banura et al., 2012). Crosbie and colleagues contend that HPV vaccine success stories from other countries prove that “a means [however] exist to prevent most cervical cancer worldwide” (Crosbie et al., 2013, p. 897). In the case of Rwanda, where HPV vaccination for adolescents is over 90% coverage, it is reported that political will has been a paramount success factor (Binagwaho et al., 2012; LaMontagne et al., 2017). This is consistent with a recent survey by Daugherty and colleagues to gain insight into the global vaccine plan for future actions, which pointed out that political will, among others, is critical to strengthening vaccine access and uptake (Daugherty et al., 2019). In a case study of progress made in HPV vaccination in Senegal, for example, LaMontagne and colleagues showed that while coverage of HPV vaccination has progressed in the past decade, four areas require dedication and attention: “maintaining momentum politically, planning successfully, securing financing, and fostering sustainability” (LaMontagne et al., 2017, p. 7). One area the authors advocate is to focus on ‘policy’ (LaMontagne et al., 2017, p. 11). Despite the numerous challenges Senegal faced, through a “[h]igh-level political commitment and multi-sectoral collaboration between partners” and effective policy program, the country successfully launched a nationwide HPV vaccination for 9-year-old girls in October of 2018 (Casey et al., 2021, p. 6).

#### **4.5 HPV vaccine policymaking process**

Vaccines have been politicized and sparked social and political controversies (Bostrom, 1997; Streefland et al., 1999; Shapiro et al., 2018; McDonald et al., 2019). The vaccine policy environment remains highly charged politically with vaccine manufactures, politicians, advocacy groups, and other interest groups in constant debate to calibrate contested controversies.

The undergirding factor to this engagement is the political will to act and introduce the vaccine as a public health good. In most LMICs, however, political will is usually lacking mainly because of competing political interest or limited resources (Agosti & Goldie, 2007; Biellik et al., 2009; Braveman et al., 2018b; Oleribe et al., 2019). To support LMICs in their effort to introduce HPV vaccines, Gavi, the WHO, World Bank, the Bill and Melinda Gates Foundation, and other nongovernmental organizations (NGOs) have stepped in to provide financial and technical support in the process (Agosti & Goldie, 2007; Edwin, 2010).

The inequity in HPV vaccine access through national vaccine programs is vast among HICs and LMICs. For example, in a 2012 estimation of national HPV vaccine programs, it is reported that in 134 HICs that were assessed, 74 had a national HPV vaccine program (55%), while in 84 LICs only 12 had HPV vaccine program (14%) (Gallagher et al., 2018, p. 4764). While this is the case, the authors showed that, in 2012, only 83,073 (14%) of cervical cancer cases were reported in HICs while 444,546 (86%) cases were reported for LMICs (*ibid*). This data shows a situation where LICs are disproportionately short-circuited regarding HPV vaccination program.

Saulsberry and colleagues posit HPV vaccine policies thrive on politicization and public perceptions gained through scientific evidence (Saulsberry et al., 2019). This view has been shared by Brandt and colleagues who equally assert in their analysis of the HPV vaccine policymaking in the U.S. that the process is fraught with “unnecessary politicization” as a result of legislators “shar[ing] inaccurate information about HPV vaccination” (Brandt et al., 2016, pp. 1624–1625).

Vamos and colleagues in their attempt to level the policymaking field for the HPV vaccine point out that “[c]ancer is a public health challenge that needs to be conquered; it is not an appropriate venue for political or ideological debate” (Vamos et al., 2008, p. 9). This statement captures the very essence of the policymaking process and how stakeholder interest can step in the ways of public health policy.

While the prevalence of cervical cancer is reportedly high in LMICs, debate around HPV vaccine access has been generally “intense in the global North” (Wailoo et al., 2010, p. xiii). The politics and policymaking process in promoting HPV vaccine in HICs is generally dynamic. The dynamism set the centerstage for how decisionmakers converge from diverse positions to accept an expensive vaccine as a public good.

In introducing a vaccination program, Wright and colleagues assert that a crucial part of the process is predicated on “developing political support for the program” (Wright et al., 2006, p. S3/128). To promote this political support system, the WHO has developed a guidance document to assist sovereign nations in drafting their own national policies on how to make vaccines accessible in a cost effective and equitable ways (WHO, 2001).

After the approval of the two HPV vaccines on the market, there has been increasing call to incorporate HPV vaccination in national immunization programs considering the vaccine’s efficacy, safety profile, and cost effectiveness, among others (Agorastos et al., 2009; Brandt et al., 2016; Cutts et al., 2007; Macartney et al., 2013; Phillips et al., 2018). The WHO, in a series of positional papers on HPV, has indicated that this must be done within the consideration of national public health prioritization, adequate financial sustainability, and cost effectiveness of the vaccination program (WHO, 2009, 2014, 2017). While some countries have made inroads in incorporating HPV vaccinations into their national immunization programs, many more still

struggle to come to this policy convergence due to lack of political will and inertia, social, and economic considerations.

The countries that have reported successful vaccination regimes have been able to do so because of comprehensive policies and programs that are fiscally sustainable with meaningful outcomes. The countries that have succeeded in this process make policy trade-offs to attain the outcomes. According to Mah and colleagues, some of the trade-offs that policy makers make when deciding on vaccination included: 1. whom to immunize, 2. how to immunize, 3. how quickly to act, 4. and who will pay (Mah et al., 2011, p. 1851). These factors influence how uptake coverage expands and determines the level of equity and access level of the vaccine by those who need it. For instance, in Sweden, while the country does have a program for HPV vaccination in place, this is not for free, however, the vaccine is available commercially at subsidized price (Ali et al., 2013). This affects the coverage rate as it cuts access off from those who cannot pay or need to divert resources to meet other needs. In the case of Africa, for example, Ngcobo and colleagues assert that the problem of HPV vaccine access is impeded by “factors such as cost and unavailability of the vaccines; inadequate financing mechanisms; poor health system capabilities for vaccination; vaccine storage and cold-chain constraints; poor access to healthcare; limited and missed vaccination opportunities; and low prioritisation of adolescent health” (Ngcobo et al., 2019, p. 14).

#### **4.6 HPV vaccine policymaking navigation in high income countries**

As of June of 2020, 107 countries, mostly in developed nations, have incorporated HPV vaccination in their immunization programs and policies (Bruni et al., 2021, p. 2). By February 2006, Italy became the first country in Europe to introduce HPV vaccine for all girls at no cost (Wailoo et al., 2010). In the case of Australia, the role of Professor Frazer and his colleague, Zhou, at the University of Queensland, and the media’s interest in the development of the vaccine was a policy drive that facilitated the country’s early acceptance and inclusion of the vaccine in its



vaccination program (Cooper Robbins et al., 2012; Frazer, 2006; Haas et al., 2009). HPV vaccine price is considered relatively higher than many vaccines (Mah et al., 2011; Wyndham-West et al., 2018). In the U.S., the price of the vaccine for a three-shot course was estimated at \$360 (Nelson, 2007, p. 24). The U.S. Federal Advisory Committee on Immunization Practices (ACIP) in 2006 reviewed Gardasil® and endorsed it with the recommendation that women up to age 26 can be vaccinated (Haas et al., 2009; Markowitz et al., 2014; Petrosky et al., 2015). Despite ACIP's recommendation, there were controversies among policymakers on whether to incorporate HPV vaccination as a mandatory universal program or based on need. Majority of U.S. policymakers agreed that universal vaccination program was an “appropriate policy” to make, however, this appropriateness needed to be balanced on need bases (Zimmerman, 2006, p. 4815). According to Zimmerman, the general acknowledgement of universal vaccination was predicated on careful consideration of “subjective, utilitarian weighing of direct HPV vaccine benefits, which are considerable, against vaccine adverse reactions, which are minor” (ibid). It is noted that the HPV policy debate in the U.S. first centered around “epidemiological, technological, and programmatic issues” then expanded to issues of mandatory HPV vaccination for “school attendance” (Mah et al., 2011, p. 1851).

U.S. HPV vaccination policymaking was fluid and maintained substantial resistance, particularly with the idea of mandatory vaccination for all adolescents (Zimmerman, 2006; Mah et al., 2011). According to Wailoo and colleagues, whereas mandatory vaccination can be “one of the most effective and efficient approaches” to rolling out a disease prevention program, it can also be “the most controversial” (Wailoo et al., 2010, p. 3). The issue of expanding HPV vaccination through school programs was thought by some policymakers as ‘premature’ (Nelson,

2007; Mah et al., 2011). Some argued that the policy idea was “inappropriate given that HPV was a precursor condition” and did not spread by casual contact (Mah et al., 2011, p. 1851).

The school vaccination program (initially targeted at girls) was perceived by some policymakers as a Merck lobbying agenda, one that undermined trust and raised issues of interest-advocacy against public good (Charo, 2007; Nelson, 2007; Gostin, 2011; Abiola et al., 2013). Merck’s “One Less” campaign, which targeted adolescent girls, was troubling to some social groups who perceived this as feminization of the vaccine in the interest of the drug maker (Wailoo et al., 2010; Daley et al., 2016, 2017). Gostin and DeAngelis asserted that the push to legislate for mandatory vaccination “undermined public confidence and created a backlash among parents” (Gostin & DeAngelis, 2007, p. 1923). According to them, this push should be coming from “[p]ublic health authorities, pediatricians, and infectious disease specialists, rather than political bodies” (Gostin & DeAngelis, 2007, p. 1922). The diverging political, economic, legal, social, and cultural positions on the HPV vaccine begun adjusting and converging for the policy to take shape and form. For example, some conservative groups, such as *Focus on the Family* and *Family Research Council*, who had earlier raised concern about the vaccine begun to tone down with recommendation that the vaccine should be made “available to parents who wanted it” (Wailoo et al., 2010, p. 4).

Undoubtedly Merck remained a major policy player in diverse areas to promote the HPV policy making process through its public campaigns, sponsorship, and policy recommendations. Abiola and colleagues, for instance, have pointed out how Merck paid “political consultants in the state capital (*California*) to identify legislators to sponsor HPV-related policy proposals” [added italicized for emphasis] (Abiola et al., 2013, p. 660). In an assessment of pharmaceutical companies and their involvement in vaccination policymaking in six states from 2006-2008, for

example, the authors pointed out that Merck participated in providing “scientific information about Gardasil® or [provided] potential policy strategies” (Mello et al., 2012, p. 895). Women in Government Foundation Inc. (WIG), a non-profit policy-driven organization of women legislators in the U.S., also “received unrestricted funding from Merck” to organize informational conferences on cervical cancer and HPV (Abiola et al., 2013, p. 660).

Another area of concern to some policymakers was in relation to the vaccine’s safety and efficacy. For instance, Congresswoman Michelle Bachmann of Minnesota challenged the safety and efficacy portfolio of the HPV vaccine during the 2011 Republican presidential debate (Intlekofer et al., 2012; Gostin, 2011; Gollust et al., 2016). Despite the policymaking challenges that ensued during this period, by November 2007, more than 40 states had introduced some form of HPV vaccine legislation spanning “from public education campaigns to mandatory vaccination for girls entering middle school” (Abiola et al., 2013, p. 646). By 2007, two states, Virginia and Texas, had incorporated mandatory HPV vaccination in its vaccination programs (Gostin & DeAngelis, 2007; Haas et al., 2009; Mah et al., 2011). According to Wailoo and colleagues, the U.S. HPV vaccine policy making process was not necessarily “about the vaccine per se but also about long-simmering cultural and political tensions” that existed among industry, policymakers, and social groups (Wailoo et al., 2010, p. xii).

In the case of Canada, the policy situation while not politically adversarial, denotes some pockets of resemblance to the U.S. policymaking. Prior to 2006, PHAC and the Canadian Association for Immunization Research and Evaluation (CAIRE) organized a workshop in November 2005 to determine the status of HPV research within Canada and elsewhere in order to “develop national research priorities before the vaccines become approved for use in Canada” (Public Health Agency of Canada, 2006). Merck begun working its way through the Canadian

policymaking environment as far as 2006. During this period, Merck lobbyists and “prominent public health practitioner advocates” urged the federal government to increase funding for immunization in the 2007 budget (Mah et al., 2011, p. 1852).

The federal government dedicated \$300 million to fund the HPV vaccines (which at the time cost \$134.95 CAD per dose) after the representatives from Merck and key government officials had advocated for this resource allocation for a nationwide vaccination (Lippman et al., 2007, 2008; Mah et al., 2011). The lobbying for the federal government to allocate funds for HPV vaccination was made without exhaustive stakeholders’ involvement. By the summer of 2008, ten provinces were already slated for school-based immunization, out of which five had instituted free vaccination program (Haas et al., 2009; Mah et al., 2011). According to Wailoo and colleagues, the U.S. HPV vaccine policymaking process became an issue of “health intervention [that was laced] with multiple and expanding political meanings (Wailoo et al., 2010, p. xxvi).

In Canada, while the federal government allocates resources for healthcare, policies on population health, including vaccination, remained a provincial and territorial responsibility (Mah et al., 2011; Wyndham-West et al., 2018). This, according to Wyndham-West and colleagues, builds “much variability in HPV vaccine policy” (Wyndham-West et al., 2018, p. 278). For instance, they point out that HPV policy making process in the province of Ontario utilized a sensemaking approach in which the making of policy decisions was done on reason and common-sense rather than on scientific evidence (Wyndham-West et al., 2018). This approach, according to Cairney, is a common phenomenon within governmental policy making processes (Cairney, 2014).

#### **4.7 HPV vaccine policymaking navigation in low-middle income countries**

The initially high cost of the HPV vaccines from its onset gave many LMICs a reason to shift away from engaging in the rush for the vaccine in the early stages of the vaccine's commercialization until later years when the price dropped (Wailoo et al., 2010). While that is the case, the policymaking process in Africa has been less adversarial. HPV vaccination uptake in the region is the lowest in the world with some of the 54 countries not having any strategic plan to tackle cervical cancer prevention and control. It has been reported that in LMICs cervical cancer prevention programs are limited and, in many cases, where programs exist, they are on “pilot” basis (Gossa & Fetters, 2020, p. 128).

In 2011, the price of HPV vaccine dropped to a record low for developing countries (\$ 4.50 USD per dose) when it was over \$100 USD in HICs (GAVI, 2020). This made it possible for some African countries to relook at their cervical cancer prevention program and policy. Around this period, Rwanda took advantage of the market situation and through negotiation with Merck became the first country in Africa to rolled out a nationwide HPV vaccination program for girls (Binagwaho et al., 2011; Lancet, 2011; Torres-Rueda et al., 2016). Rwanda received 2 million doses of Gardasil® vaccines donated from Merck for a period of three years, as a starter-pack for its program. After the three-year arrangement with Merck was about to end, Gavi intervened to continue the arrangement with Merck to keep the supply of HPV vaccine to Rwanda until 2017 (Torres-Rueda et al., 2016). Rwanda's HPV program reportedly achieved a 93.23% coverage rate in the first year (i.e., 2011) of the program initiation (Binagwaho et al., 2012, p. 625).

Like the case in the U.S. and elsewhere, the Rwanda HPV vaccination program was not without controversy, both nationally and internationally. For instance, in a correspondence with *The Lancet*, Ouedraogo and colleagues expressed concern that the arrangement between Merck and Rwanda was not in the “best interest of the people” (Ouedraogo et al., 2011, p. 315).

Ouedraogo and colleagues believed the Minister of Health's position as a board member of Gavi presented a conflict of interest. They argued against the safety and effectiveness of the vaccine and pointed out that Rwanda was misplacing its health priority needs as cervical cancer "ranks well behind that of other vaccine-preventable diseases" (Ouedraogo et al., 2011, p. 316). There was also the fear that after Gavi's period of funding the program (2014-2017) is over, Rwanda will not be able to continue the program. Thus, truncating an over publicized program will be "unpopular" and defeatist (ibid). While the HPV vaccine policy/program in Rwanda presents a practical policy case in Africa, many African countries in their attempt to formulate HPV policy or programs have been faced with policy inertia and sometimes no action at all. For example, South Africa, which is also among the countries in Africa with the highest prevalence of cervical cancer (Fonn et al., 2002; Jordaan et al., 2016; Olorunfemi et al., 2018), was one of the few countries on the continent to take proactive steps towards addressing the diseases (Denny, 2010; Francis et al., 2011; Denny et al., 2014). In 2000, the National Department of Health in South Africa characterised cervical cancer as a national health priority (Harries et al., 2009; Sinanovic et al., 2009). This governmental priority setting set the policy pace for the country to introduce a national cervical screening policy that allowed all women to receive free Papanicolaou (Pap) smears (Moodley et al., 2006; Harries et al., 2009). In 2012, the South Africa government introduced the Integrated School Health Programme (ISHP), which aimed to address health issues leading to morbidity and mortality among learners. This setup served as a vehicle for the South African school-based HPV vaccination program to be enrolled (MacPhail et al., 2013). By April 2014, through ISHP, South Africa introduced the national school base HPV vaccination program (Harries et al., 2009; Delany-Moretlwe et al., 2018; Ngcobo et al., 2019). By the close of 2014, South Africa reported 85% coverage for the first dose with about 500,000 female students (Ngcobo et al., 2019, p. 13). While

South Africa made significant strides in its approach, subsequent schedule vaccine uptake and coverage dropped between 2014-2016 (Delany-Moretlwe et al., 2018; Ngcobo et al., 2019). It is, however, important to note that the policymaking process in South Africa to introduce the HPV vaccine received general support and was not characterised with resistance (Harries et al., 2009). This linear policy trajectory coupled in political will allowed South Africa to succeed. Like in many cases in the introduction of vaccines in resource-constrained settings, the cost of the vaccine has been a push back to the roll out of the program and also decreasing coverage (Sinanovic et al., 2009; Delany-Moretlwe et al., 2018). Sinanovic and colleagues in an earlier assessment pointed out that the inclusion of the HPV vaccine in the South African national cervical cancer prevention program can be cost effective, and moreover, achieve affordability level provided the pharmaceutical companies commit to “price reductions” (Sinanovic et al., 2009, p. 6201). However, the delays in introducing the vaccine, like in many other African nations, is a lost public health opportunity. Many LICs, especially in Africa, continue to miss out on opportunities to save the lives of women.

In Ghana, for example, while in recent times a few grassroots advocacy groups are emerging to spearhead cervical cancer education, the task to address the disease at the government level does not receive the needed attention despite the fact that cervical cancer cases are on the rise (Binka et al., 2017; Nartey et al., 2017). While this is the case, awareness level remains “very low” even among nurses in Ghana (Williams et al., 2018, p. 592). In a recent cross-sectional study of 285 adolescents across the 16 Ghana, the authors show that about 91.2% of the participants have not heard of “HPV”, while 95.4% have not heard of “HPV vaccination” (Asare et al., 2020, p. 1). Previous studies across the country have reported similar findings (Ziba et al., 2015; Binka et al., 2017; Williams et al., 2018).

#### **4.8 Conclusion**

There is a noticeably significant gap in HPV vaccine coverage between HICs and LMICs due to factors such as economic resource differences, functional healthcare systems, limited prioritization of available interventional resources, and political will to act (Vu et al., 2018; Gossa & Fetters, 2020). Clearly, the high prevalence of cervical cancer in LICs portrays a case of global health inequality. Gossa and Fetters have referred to this inequality as an ethical problem that expresses an “epidemiological tragedy” needing prioritization from policymakers and international donors (Gossa & Fetters, 2020, p. 126). As Gostin points out, “the inequitable distribution of disease and early death between the rich and poor – represent perhaps the most enduring and consequential global health challenge’ (Gostin, 2012, p. 2087). The absence of national cervical cancer screening programs and HPV vaccination for adolescents takes away opportunities to reduce cervical cancer incidences. Noting that actor’s interest and their role is critical in successful HPV vaccination program, reconciling public health policy and public health issues must be done in a way that separates interest of actors from the objectives of the public health program. This, according to Abiola and colleagues, “demands a high degree of skill and sensitivity to both science and the political environment” (Abiola et al., 2013, p. 676). It captures the very essence of the policymaking process and how stakeholder interests overlay public health policy. The focus in the public health policymaking process should be on substantive issues and not on negotiations surrounding actor’s interests that undermine social good. To avert resistance of public health policy, the call for action must be balance with considerations of morbidity and mortality incidence of disease in the population (Childress et al., 2002; Abiola et al., 2013).

The vast difference in HPV vaccination program among HICs and LICs continues to expand despite the global call for efforts to eliminate cervical cancer. The absence of political will delineates a neglect of the human right to health. According to the WHO, the right to health, is a



marker to the fundamental human right to life which allows everyone the “enjoyment of the highest attainable standard of physical and mental health” (WHO, 2002). The under prioritization of HPV-related cervical cancer portrays a lack or absence of political will to make HPV vaccines available and accessible to those who need it. The unavailability and inaccessibility of the vaccines breach opportunity for the enjoyment of quality life. It is for this that political will to address health related issues must be of highest priority. While that is the case, it is important to point out that the factors promoting political will and the interest that underlie it are complex. Synergizing political will and how policy actors converged to develop programs and policy can be a puzzling maze to navigate. While this is the case, I sympathize with prioritizing and having effective policy in place that must be pushed forward through political will to control and prevent HPV- related cervical cancer. This, by itself, is not only a noble ideal but also an economic instrument to empower women, at the same time satisfying human rights objectives to the right to life (Fathalla, 2006; Ginsburg, 2013; Brandt et al., 2016).

## **5 Research methodology**

### **5.1 Overview**

In this chapter, the theoretical frameworks that are applicable to orienting and driving the research questions in its appropriate dialectical perspective are outlined. The applicable approaches (e.g., qualitative, quantitative, and mixed methods) that are used in the research are also expounded. Justification is made for the selection of approaches (i.e., mixed method) that are deemed most suitable for the research.

### **5.2 Theoretical frameworks**

The theoretical framework provides a particular lens through which the research problem questions can be conceptually viewed. According to Niederman and March, a lens is “a physical or conceptual mechanism through which phenomena “come into focus” (Niederman & March, 2019, p. 3). It provides the fundamental/structural basis (blueprint) that undergirds how the problem or research questions are philosophically, epistemologically, methodologically, and analytically approached (Osanloo & Grant, 2016, p. 13). The theoretical frameworks employed in understanding, evaluating, interpreting, and analysing this research questions are described below.

#### ***5.2.1 Sensemaking: understanding stakeholders’ rationale for policy choices***

Sensemaking is the process whereby policymakers give self-interpreting meanings to ideas regarding a social issue, development, or experiences. Sensemaking provides a basis for policymakers to rationalize and/or normalize a prescribed policy choice for interventions (Brown et al., 2008; Weick et al., 2005). The pattern of fluidity, usually of ideas, thoughts, experiences, interpretations, memories, emotions, and understanding are presented/communicated in storytelling form by the participants. An advantage for using sensemaking to understand a research problem is that “everyday actors” rather than absolute reliance on expertism is engaged (Nauer

et al., 2008). Sensemaking thrives on information as it opens the portals for the examination and usage of “fact, knowledge, data and the concept of information itself” (Naumer et al., 2008, p. 5).

Sensemaking may present ambiguity and a probable overconfidence position that may be taken by a participant(s) (Ibarra & Andrews, 1993; Holt & Cornelissen, 2014). This position can short-circuit the validity and reliability of the sensemaking outcome. The problem can be mitigated by putting into consideration the power, interest, influence, resource base, networks, and knowledge of the participants involved and systematically engaging their role with the problem. In the application of sensemaking as a framework for this study, actions of stakeholders are analysed as a process to establish how their experiences, understanding, knowledge or the lack thereof, informs their policy choice.

### ***5.2.2 Multiple Stream Framework (MSF): understanding the policymaking process***

The MSF was pioneered by John Kingdon in the 1980s exclusively using U.S. policy case examples with application within the congressional systems (Kingdon & Stano, 1984; Baumgartner & Jones, 1991; Kingdon, 1995; Béland & Howlett, 2016). The framework has received considerable popularity in comparative policy research within and among nations (Béland & Howlett, 2016; Herweg et al., 2018). The framework put into consideration three streams (problem, political, and policy) wherein these streams dynamically “interact to produce windows of opportunity” for action during governmental agenda setting (Béland & Howlett, 2016, p. 222).

**Table 5: Kingdon MSF Taxology**

Component	Description
Problem Stream	<ul style="list-style-type: none"><li>▪ Conditions that elected officials or citizens want addressed</li><li>▪ Conditions defined as problems by beliefs, values, language/framing</li><li>▪ Policy makers and public become aware of problems through focusing events, indicators, or feedback</li></ul>
Policy Stream	<ul style="list-style-type: none"><li>▪ “Soup of ideas” competing for acceptance in the policy community</li><li>▪ Policy proposals must meet certain criteria to survive</li><li>▪ Technical feasibility: policy can be implemented in practice</li><li>▪ Value acceptability: policy captures certain constructs, such as efficiency or equity, deemed important in policy community</li></ul>
Politics Stream	<ul style="list-style-type: none"><li>▪ Composed of factors such as public mood, interest group campaigns, election results, partisan or ideological composition of electorate or legislature, and changes in administration</li><li>▪ Political factors that influence policy makers’ decisions include attention to constituent reactions to policy proposals</li></ul>
Policy Window	<ul style="list-style-type: none"><li>▪ Brief, generally unpredictable opportunities to advance policy proposals because of convergence of problem, policy, and politics streams</li><li>▪ Often because of shifts in political stream (change in administration, party control of legislature, or public opinion)</li></ul>
Policy Entrepreneurs	<ul style="list-style-type: none"><li>▪ Advocates who invest significant resources to promote a position</li><li>▪ Generate and disseminate ideas, define, and reframe problems, specify policy alternatives, develop political strategy, collaborate with other entrepreneurs and organizations</li></ul>

Source: Kingdon, J. W. (1995). *Agendas, alternatives, and public policies*. 2nd ed., Vol. 2.

In a meta-analysis of publications that have utilized this framework from 2000-2013, Jones and colleagues showed that of 311 English-language published articles that applied MSF, 28% were on health while 14% were on governance (Jones et al., 2016, p. 21). The authors conclude that MSF has become a “very productive and analytically useful way to study public policy” (p. 30). While this framework has received wide acclaim, it has also been criticized for its overuse in multiple areas, thus losing clarity and drowning into abstraction (Jones et al., 2016; Cairney, 2018; Zahariadis, 2019). To connect the metaphor of streams and windows of opportunity, which are pivotal to MSF, researchers are encouraged to employ these pivots in systematic ways that engage the empirical data of the research (Jones et al., 2016; Cairney, 2018). Another problem that the

framework presents is that “it is not a priori certain who the agents are in this process and how they interact with each other” (Mukherjee & Howlett, 2015, p. 65). Research can surmount this problem by having direct engagement with the actors in the policy process and understanding firsthand how interaction among the actors’ progress. While researchers may not always engage all actors or witness interactions amongst them, researchers can collect these data/knowledges from stakeholders or informants who have work, interacted at the policy level, and engaged these actors in various policymaking environments.

To resolve some of the shortfalls identified with the MSF, Mukherjee & Howlett have proposed a refinement to the three streams (problem, political, and policy) by suggesting the designation of three distinct actors who will “engage in one specific type of interaction”: [1] involved in the definition and /or articulation of policy problems, [2] the development of solutions, or [3] their enactment (ibid).

These distinct characterizations of actors commit to a cross fertilization of other frameworks that align with the problem, politics, and policy interface of MSF:

1. Epistemic Communities (Haas, 1992) - engaged in discourses about policy problems
2. Instrument Constituencies (Voß & Simons, 2014) - define policy alternatives instruments
3. Advocacy Coalitions (Sabatier, 1988) – Actors compete to have their choice of policy alternatives adopted

The process of understanding the policy environment of vaccine access within the MSF will be performed qualitatively through reviews of publicly-accessibly policy documents, literature, and interview of relevant actors, such as governmental officials and policy entrepreneurs-actors who influence policy outcomes to their advantages (where possible).

### **5.2.3 Actor-Network Theory: description and evaluation of actors**

Actor-network theory (ANT) is an evaluative tool for assessing actors' actions within various levels (networks) of influence in the social space. The early works of Latour (Latour, 1987) and Callon and Law (Callon & Law, 1986) formed the foundational grounds for the theory. It is predicated on the fact that action determines outcomes and actors could be entities with power to dominate, or agents without initiatives, that allows themselves to be dominated (Latour, 1996; Callon, 1999; John, 2009). The theory perceives the world as consisting of networks, where all actors function within their unit networks either by will or implicit compulsion (Callon & Law, 1986; Latour, 1994; John, 2009; Bilodeau & Potvin, 2018). As pointed out by Bilodeau & Potvin, "ANT is a powerful theoretical tool" in that it proposes "a relational view of action" (Bilodeau & Potvin, 2018, p. 175). ANT theorizes that actors possess and share common information among themselves (network) that is inaccessible to those who are not in that network, however, may be affected by the actions or decisions of the actors in the network (Latour, 1996; John, 2009; Bilodeau & Potvin, 2018). The theory proposes that actor configuration and the number of connections through which they are linked "determines what the actor is, wants, and can do" (Callon, 1999, p. 185). As pointed out by Michel Callon, ANT may consider the "actor's size, its psychological make-up, and the motivation behind its actions" (Callon, 1999, p. 181). ANT considers actors within the network to be humans or non-humans (Callon, 1999; Latour, 1994; Bilodeau & Potvin, 2018). For example, within the access to medicine space, governments, non-governmental organizations, pharmaceutical companies, and civil society groups are all actors that can be lined up to trace their connectivity within a network and their level of influence. By its conceptualization, ANT provides toolkits for understanding and evaluating what transpires inside the networks constituting the black box of vaccine access. ANT aids in gathering "relevant components in a situation" (Bilodeau & Potvin, 2018, p. 175). For example, the role of the actors,

their financial resource, values, beliefs, norms, culture, etc. It can also be used to analyze “strategic positions and power relationships, points of convergence and divergence with regards to the situation in question” and what is at stake for them, and distinguishing areas of stronger and denser connections” (ibid). Qualitatively, information about actors is collected from public domains, such as the internet, actors’ public reports, meeting proceedings, and social corporate activities to describe the actors. Quantitatively, actors’ resources and measurable effects in society is collected to evaluate the level of actor influence in access to vaccines.

#### ***5.2.4 Human Rights Framework (HRF): understanding the research problem in terms of the right to health, actors’ actions, and responses related to vaccine access***

Human rights as a framework for action guidance has been used to push for the rights of people through the application of treaties and laws for the past five decades (Galvão, 2005; Hogerzeil et al., 2006; Cohen-Kohler et al., 2008; Gruskin & Raad, 2010). Jonathan Mann points out that “protecting human rights may be essential for promoting and protecting health” (Mann, 1996, p. 925). Hogerzeil and colleagues have shown that by enforcing human rights treaties and laws, governments can rise to the responsibility of increasing access to medicine, particularly in societies where “social security” is advanced (Hogerzeil, 2006, p. 311). According to Jonathan Mann, a “human rights framework provides a more useful approach for analysing and responding to modern public health challenges than any framework thus far available within the biomedical tradition” (Mann, 1996, p. 924). After Halfdan Mahler drew attention to making medicine available at reasonable prices during the 28th World Health Assembly (WHA) meeting in 1975, and the eventual setting up of the first Essential Medicine List (EML) in 1977, access to medicine has gained and maintained a position within the social space as a fundamental human right that supports the right to health. This is indicative through several international treaties and other legally binding documents. For example, in Article 24 of the United Nations Declaration on the

Rights of Indigenous Peoples, it indicates that “indigenous peoples have the right to their traditional medicines” (UN General Assembly, 2007). A similar statement has been made in general comment No.14 of the Committee on Economic, Social and Cultural Rights (OHCHR, 2000, p. 1). Understanding the problem of access to vaccines within a fundamental human rights framework is useful as it provides a lens through which to make sense of government policymaking processes, health system formation and breakdowns, and/or behaviors of corporations that affect human life (Farmer et al., 2004; Mann et al., 1994; Perehudoff et al., 2019). This is so because, the application of HRF to gauge behaviors of stakeholders, corporations, systems and/ processes that are tied to vaccine access can illuminate on acts or outcomes that can have linkages to/or potentially infringe on the right to health, which consequentially can become a fundamental human rights issue. According to Mann and colleagues, HRF is a useful tool for “defining and advancing human well-being” (Mann et al., 1994, p. 9). Perehudoff and colleagues assert that the application of right to health indicators to establish human rights norms “holds governments accountable for designing equitable and efficient health systems in which individuals can enjoy the full range of their health rights” (Perehudoff et al., 2019, p. 442). On a similar trajectory, Alicia Ely Yamin has pointed out that in the application of a human rights framework, “health is produced, experienced, and understood in the social, political, historical, and economic contexts” (Yamin, 2008, p. 47). This facilitates addressing issues of injustice (Jochnick, 1999), inequality (Farrer et al., 2015), and structural violence (Farmer et al., 2004). HRF is applied qualitatively through document search and analysis, survey, and interview of actors (e.g., governmental, and relevant non-governmental officials, senior industry officials, etc.) to inform the human rights component of the research questions, particularly on access to vaccine as a right to health. This can help to understand the cause(s) of equity in vaccine access.



### **5.3 Qualitative research approach**

Qualitative research methods emphasizes the construction or reconstruction of social context and meaning on the basis that social truths and realities can be found and/or understood in the daily social interactions and events of people (Seale, 1999; Creswell & Creswell, 2017; Creswell & Poth, 2018; Lindsay, 2019). It is as such mostly applicable in the investigation, evaluation, and interpretation of multiple social realities (Fossey et al., 2002; Patton, 2005; Denzin & Lincoln, 2017; Lincoln & Guba, 2017; Carminati, 2018). In taking a qualitative approach, researchers attempt to make sense of the information obtained without manipulating the factors of interest in the information provided. It gives a naturalistic view of human experience from the past, present, and reasonable projection into the future (Seale, 1999; Patton, 2005; Creswell & Creswell, 2017). The process can be creatively exploratory of realities, which is dependent on how the research is designed.

While this is the case, the multiple perspectives of realities presented by informants in this approach may present difficulties in distinguishing between “cause and effect” of the research problem (Johnson & Onwuegbuzie, 2004, p. 14). Another challenge that has been noted for this methodology is its subjectivity and heavy reliance on people who might have biased perspective(s) (Brock-Utne, 1996; Healy & Perry, 2000; Golafshani, 2003). This has the tendency to develop into information/data validity and reliability challenges. In lieu of these challenges, qualitative research scholars have called for research information validity and reliability as necessary process checks for removing biases (Brock-Utne, 1996; Golafshani, 2003; Patton, 2005; Noble & Smith, 2015). This is intended to build trustworthiness into the research outcomes (Golafshani, 2003; Connelly, 2016). Despite this call, it has been pointed out that reliability in qualitative research, as being proposed, is a “misleading” concept because its consideration in the research criterion is indicative that the “study is not good” (Stenbacka, 2001, p. 552). Nevertheless, qualitative research

methodology has received a strong presence within health management and as policy research tool (Meyer, 2000; Murphy & Dingwall, 2003; Timmermans, 2004; Mays et al., 2005; Dingwall, 2020). For example,

- Narrative (narratology) - the “study of narrative and narrative structure and the ways they affect our perception” (Czarniawska, 2010, p. 58) and involves telling the story told by research participants and interpreting this in value terms.
- Thematic Analysis - systematically identifying, organizing, and offering insight into patterns of meaning (themes) across a data set” (Clarke & Braun, 2014, p. 57).
- Document Analysis - “systematic procedure for reviewing or evaluating documents—both printed and electronic (computer-based and Internet-transmitted) material” (Bowen, 2009, p. 27).
- Phenomenology - “understand human experience from the individual’s perspective” by investigating lived experiences of participants in descriptive terms (Knaack, 1984, p. 108).
- Ethnography - studies “social interactions, behaviors, and perceptions that occur within groups, teams, organisations, and communities” (Reeves et al., 2008, p. 512).

#### **5.4 Quantitative research approach**

Quantitative research is a positivist approach, which follows a path of logicism and empiricism (Holton & Burnett, 2005; Sukamolson, 2007; Goertzen, 2017). It employs the collection of datasets and analysis of these datasets to establish how the data impinges on the research questions.

Quantitative research methods have the strength of generating testable hypothesis (Golafshani, 2003; Tacq, 2011; Töller, 2012). The process of testability compels “causal determination, prediction, and generalization of findings” (Golafshani, 2003, p. 600), and leads to maintaining stable validity of data, reliability, and objectivity because of data reproducibility. The very strength of qualitative methods, however, presents a basis for its critique. For example, Seale argues that quantitative research approach may be “more fallibilistic”, in that the outcome is not necessarily conclusive or reasonably justified (Seale, 2002, p. 108). This is because respondents

may choose to answer questions in a particular way to satisfy the researcher (courtesy bias) (Lakshman et al., 2000; Mitchell, 1993). Because the process of data churning and information processing is stable and deterministic, outcomes can be reproducible, yet unreliable.

## **5.5 Mixed methods approach**

Mixed method approaches in the past three decades has received extensive attention in the social sciences as a formidable research tool with substantial application in different disciplines (Gregar, 1994; Kadushin et al., 2008; Terrell, 2012; Creswell & Creswell, 2017; Harrison et al., 2020). This is because the method is highly utilizable in answering questions in diverse research scenarios. Mixed methods also combines multiple approaches or methods that incorporate different assumptions, thus providing “a more comprehensive analytical technique” (Onwuegbuzie & Teddlie, 2003, p. 353). This allows for independent data collection and analysis and dependent integration of the data for interpreting (Onwuegbuzie & Teddlie, 2003; Terrell, 2012; Creswell & Creswell, 2017).

A useful advantage of a mixed methods approach, which is applicable to triangulation<sup>8</sup>, is that biases in one method might be revealed by the other method(s) used (Onwuegbuzie & Teddlie, 2003; Johnson & Onwuegbuzie, 2004). According to Kadushin and colleagues, the method “excels at bringing insights derived from diverse methods to the analysis of a given phenomenon” (Kadushin et al., 2008, p. 47). While mixed methods have been positioned as a value-added methodology over any single one approach, it has however been criticized for lack of clarity as to what it intends to achieve in the research question (Miller & Gatta, 2006; Kadushin et al., 2008). For example, Miller and Gatta have questioned how mixed methods can be utilized in “[enhancing] validity, reliability, or deeper interpretations of what is being studied” (Miller & Gatta, 2006, p.

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<sup>8</sup> Triangulation involves measuring the same concept using multiple approaches (Kadushin, et al., 2008, p. 47). It is considered under mixed methods; therefore, not discussed in isolation.

596). The question arises from asymmetrical information representation and the challenge of effectively linking qualitative and quantitative approaches, thus, questioning data validity (Mactavish & Schleien, 2000; Foss & Ellefsen, 2002; Salehi & Golafshani, 2010). Researchers have also questioned the ability to synchronize the different “epistemological and philosophical frameworks” of qualitative and quantitative methods (Salehi & Golafshani, 2010, p. 189). To resolve these problems, clarity and consistency in research design is a helpful start (Mactavish & Schleien, 2000). It has also been recommended that researchers must firstly question if combining the two methods assures reliable results or not (Salehi & Golafshani, 2010).

## **5.6 Research method selection**

While acknowledging the strengths that each methodology exclusively present in addressing the research question, and considering the weaknesses/challenges of each method, mixed methods can provide a much stronger tool for analysis, dependent on the research question(s). This is premised on the fact that, qualitatively, I seek to understand and know the perspectives of actors relevant to my research questions. In recruiting participants, I employ purposive and snowball sampling approaches for the study. The responses are thematically analysed and complemented with document reviewing for context validation and reliability. Interviews and questionnaires are employed to collect data. Interviews are designed to elicit meanings, opinions, experience, perspective, or knowledge of an individual or group of persons about issue(s) that are of relevance to a research problem (Gubrium & Holstein, 2001). Google Form online survey tools are employed to collect study relevant data from the public. Planned interviews with policymakers, senior governmental officials involved with HPV decision-making, health professionals working directly with decision on HPV vaccines, and relevant NGOs concerned with HPV vaccines or cervical cancer, are conducted. I employ document analysis by reviewing HPV policy related policy documents (or literature) from Canada, Rwanda, and Ghana. This is contextualized for the

document content value, wordings, statements, codes, etc. that underlie access, policy commitment to HPV vaccine uptake, or cervical cancer control and prevention. Quantitative survey data that are collected corroborate the qualitative (from interview/document) information obtained for complementarity. This process (numerical and textual data collection) reinforces trustworthiness and credibility in the research (Creswell & Creswell, 2017; Creswell & Poth, 2018).

## **5.7 Analytical frameworks**

### **5.7.1 *Thematic analysis***

Thematic analysis is used to analyze and interpret the interview and questionnaire responses (raw data collected). According to Braun and Clarke, “[Thematic Analysis] is a method for systematically identifying, organizing, and offering insight into patterns of meaning (themes) across a data set” (Clarke & Braun, 2014, p. 57). Thematic analysis allows the researcher to qualitatively make sense of the data collected in a manner that allows the researcher to detect and identify meanings and experiences that are common within the data collected (Bowen, 2009; Clarke & Braun, 2014; Maher et al., 2018). An advantage of using thematic analysis to interpret the data collected is that it “confer[s] accuracy and intricacy and enhance the research’s whole meaning” (Alhojailan, 2012, p. 40).

### **5.7.2 *Document analysis***

Document analysis is also employed to interpret and understand how policy instruments are used to support, limit, or delimit access to vaccines (e.g., HPV vaccines), the prioritization of women’s health and right to health. Documents may be represented in textual or graphical contents and are recorded, shared, and logically organized with no “intervention” from the researcher (Bowen, 2009, p. 27). Bowen further posits that document analysis is “a systematic procedure for reviewing or evaluating documents-both printed and electronic (computer-based and Internet-transmitted) material” (ibid). The process is a relatively low-cost approach to obtaining empirical

data as it does not engage secondary obstruction that interferes with the meaning and originality of the content. The combination of document analysis with thematic analysis from interviews minimises bias and establish credibility in the overall research data collected. (Bowen, 2009, p. 38). Even though interview responses from participants risk subjectivity, the process also deepens and broadens the experiential truth of the participants. The utilization of document search and interview is to seek validation and corroboration from different sources and data collected.

### **5.7.3 Computer assisted qualitative data analysis (CAQDA)**

Computer assisted qualitative data analysis (CAQDA) are software used to assist researchers to qualitatively analyse text, audio, or graphics. CAQDA builds transparency and trustworthiness in the data analysis process as it removes the bias of manual data assemblage and interpretation (Maher et al., 2018; O’Kane et al., 2021). Amidst the array of useful CAQDA available to researchers, NVivo is employed for this research. Nvivo effectively codes and organizes textual data collected into categories and themes. The themes derived then drive the analysis and conclusions (Hilal & Alabri, 2013; Sotiriadou et al., 2014). Nvivo is selected for this research because of its simplicity and ability to capture quantitative and qualitative open-ended interview data (Davis & Meyer, 2009; Dollah et al., 2017; Feng & Behar-Horenstein, 2019).

## **5.8 Data collection consideration**

Two considerations are made in the data collection process:

1. Participant’s ability to influence decision-making process.
2. The impact of policy decisions on participants.

## **5.9 Data collection strategy and analysis**

Purposive and snowball sampling approaches were employed to recruit participants for the study through interviews and questionnaires (Mixed Method). For questionnaires administered, online survey tools (Google Forms) were employed to collect data for analysis. While online

survey tools, such as SurveyMonkey and Qualtrics<sup>SM</sup>, could be employed for survey data collection and provide equal performance as Google Forms, they are, however, more expensive. The advantage of using the Google Forms is that it is free and easy to use. It is for this reason Google Form is preferred for this research.

#### **5.10 Data collection inclusion criteria**

Stakeholders who have significant knowledge or experience in HPV vaccines or cervical cancer, such as physicians, scholars, women health advocates, etc., are consulted for the interviews. Government and non-government institutions that make policy decision on vaccination, women's health, or cancer are also included in the interviews.

#### **5.11 Anticipated study challenges**

Research studies in many African countries may take much longer time due to incumbering bureaucratic procedures or protocols a researcher may need to surmount, especially at the government institutions level. The challenge is mitigated by making advanced arrangements with participants, with reasonable reminder notice prior to meeting (either in person or virtual) for interview/data collection. The prior arrangements ensure that a good rapport is created with the interviewee and assures that all bureaucratic hurdles are addressed in advance. Semi-structured interview questions are open-ended with the possibility of follow up questions that are relevant to the study. For interviewees who are constraint by time, a Microsoft Word copy of the interview questions is sent to them to be completed within a reasonable time and returned upon completion by email address provided in the informed consent. Some officials also sought rewards before providing information or data. This is addressed through dialogue by expounding on the value the study brings to the health policy decision-making process. For in-person interviews, incentives such as gift cards and York University souvenirs such as T-shirts, mugs, or pens were part of the compensation package to participants for their time. In rare cases, interviewees who demonstrated

a need for funds to support their activities (e.g., NGOs) were donated a maximum of \$50 CAD. It was anticipated that not all administered questionnaires would be returned. Participants were encouraged to complete questionnaires as their responses may become a measure of policy recommendation for HPV vaccine policy especially in underserved settings in LMICs. COVID-19 presented new study challenges. This meant not all interviewees were comfortable with a face-to-face interaction. In the event of a face-to-face interaction, adherence to all COVID-19 protocols were strictly followed. If the interviewee was actively involved/engaged in other COVID-19 related responses, they were excused from the study, however, they were requested to suggest another competent person/people for the interview.

#### **5.12 Research ethics and consideration**

This research received ethics approval from the Human Participants Review Subcommittee, York University's Ethics Review Board, Office of Research Ethics (ORE) and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. The ethics approval certificate for this research is #: STU 2021-137. Research participants to be interviewed were provided with a consent form to review and return via email or other electronic means, such as WhatsApp, to ensure they understood their roles. Interviews only began once consent was received from interviewee. Due to the COVID-19 pandemic, identified interviewees were encouraged to agree to a remote interviewing via phone, Microsoft Teams, Zoom, Skype, or any other VOIP platform that the interviewee was comfortable with. As an alternative, structured interview questions were sent to interviewees via emails for completion at their own convenience; however, they were encouraged to return their responses within a reasonable timeframe for the timely and successful completion of the research. Participants to be interviewed were deemed literate enough to read, write, and be able to comprehend simple sentences that explained expectations from them in the interview and the ethical considerations made in the research. In the



unlikely event a participant identified for interviewing could not read, write, or comprehend simple sentence, such participants were excluded from the selection criteria for the research interview and survey. All personal information obtained were blinded with codes. Only the researcher and the supervisor could decode this information. This is designed to protect the identity and personal information of the interviewees. Prior to beginning the interview, the objectives of the research were explained to the interviewee.

The ethical considerations of the right of the interviewee to voluntarily leave the interview at any time prior to the planned allotted interview time was explained to the interviewee. In the event an interviewee requested to be removed from the study while the interview was ongoing, the interview comes to an immediate stop. Where an excerpt of the interview is handwritten in shorthand into the research book, the scripted shorthand is cancelled in the research book. A note is made along with the cancellation with date and time when the interviewee requested to be removed from the study. The interviewee would be relieved from the study and the information obtained up to the point of the interviewee being removed is not considered as part of the study data collection, or for any other publication purpose. In the event the interview was recorded, the recording is stopped. No transcript would be produced from the recordings. The recordings will not be used for the data collection purposes or any future publication. Upon the interviewee's request, the recording would be destroyed by deleting permanently from the recording source/equipment immediately, or later when it is convenient for the interviewer to do so. If the interviewee makes the request to be removed after the interviewing process has been completed, the interviewed data stored either handwritten in the research book or recorded on a recording device would not be used for the study. In the event of participants completing online questionnaires or structured interview questions that are sent to interviewees by email for

completion as part of data collection, participants/interviewees were required to consent to participation prior to beginning. Questionnaires/structured interview questions were aimed at targeted groups and the data obtained was stratified as such for analysis.

### **5.13 Research data protection and confidentiality**

All information provided during the research is held in confidence, and unless specifically indicated by the participant in writing, participant name will not appear in any report or publication of the research. All individual information collected is coded to avoid the risk of third-party tracing. Interviewing data are collected by journaling participant's comments into a dedicated journal for this research. This is transcribed (same day where possible) into a Microsoft word document and stored in a passworded folder on the researcher's laptop, and only research staff (e.g., supervisor or dissertation committee members) can have access to this information. At the end of each interview session, the researcher repeats in summary format the key points mentioned by the participant to ensure the researcher has captured correctly what the interviewee had said. The research journaling is shorthand written to make it difficult for easy transcription by a third party. The research journal book is kept in a dedicated binder designated for the research project kept in the researcher's home office. In the event the participant permits the use of an electronic recorder to capture the interview session, the data stored on the electronic recorder (or phone conversation recorder app) is saved in a passworded secure paid electronic vault for a minimum of two years, thereafter, retrieved and destroyed. Once the research is over, the research journal book together with all other data collected such as email responses will be stored for a minimum period of two years, after which it will be destroyed. Confidentiality will be fully provided as is required by law to protect participants. Electronic documents such as Google Forms used to collect data will be retained for a minimum of two years after the research is completed and thereafter permanently deleted from the Google cloud platform.

## 6 The Canada case study: Recasting the nationwide HPV vaccination program in Canada - Sensemaking policy approach in Ontario

### 6.1 Abstract

**Background:** HPV vaccination policymaking process in Canada is quite distinct as the different provinces and territories developed vaccination programs independently. Immunization programs in Canada are varied and can be complex depending on the actors and their interest at the fore of the vaccination program. This study recast the HPV vaccination policymaking process in Canada using Ontario as a case study.

**Methodology:** This case study is divided into two parts. The first part provides an overview of immunization programs development in Canada and by extension, provincial and territorial HPV vaccination programs. To buttress this, a scoping review was conducted using Google Scholar, PubMed, and ProQuest to retrieve publications on HPV vaccination policymaking process in Ontario. Out of 484 publications retrieved, only 4 were retained for analysis using five themes to recast the policymaking process.

**Findings:** The qualitative analysis largely located that sensemaking was the policymaking approach adopted during the HPV policymaking process in Canada and for that matter, Ontario. The analysis also shows that the financial push from the federal government, framing, and normalization of the HPV vaccine as a breakthrough cervical cancer vaccine implicitly helped silence policy adversaries. Thus, stabilizing the provincial policymaking process to proceed virtually unhindered.

**Conclusion:** The evidence reveals that the federal resource allocation was a deciding factor, in addition to the effective policy framing and normalization of HPV vaccine as a critical prophylactic against HPV infections and prevention of cervical cancer. Shortcomings in sensemaking are identified and a policy choice stability check is proposed to streamline sensemaking. The policy choice stability estimation of the sensemaking policymaking process in Ontario shows that the process was 85% stable and sustainable.

**Keywords:** policymaking, vaccination, HPV, sensemaking, normalization, Ontario, Canada

### 6.2 Introduction

According to the Public Health Agency of Canada (PHAC), cervical cancer is responsible for 1.3% of all new female cancer cases in Canada, accounting for 1.1% of all female cancer deaths (Public Health Agency of Canada, 2017). Canada is one of the first OECD countries that introduced HPV vaccination program for primary school going girls. Canada has universal primary care with cervical cancer screening every 2 years for women of reproductive age. It is important to mention that, while Canada has universal primary care, drug coverage is currently not fully universal. It has been reported that about 67% of the Canadian population secures additional

insurance through private means for extra benefits (Thomson & Jun, 2012, p. 6). The provincial, territorial, and federal governments have normally financed the healthcare system in Canada. Routine and recommended vaccines remain a public health intervention and are therefore categorized under the Canadian universal healthcare system (Shefer et al., 2008, p. K72). Nevertheless, situations where a few citizens purchase vaccines out of pocket exist.

Canada is one of the OECD nations that continues to show significant decline in cervical cancer incidence and mortality. The existing cervical cancer preventive programs such as screening which leads to early detection and treatment, and the introduction of HPV vaccination program for adolescents have contributed to this decline in cumulative ways. For example, in a study conducted in Alberta, Canada, to assess the effect of HPV vaccination on cervical cancer screening among 10,204 study population, the authors concluded that women who received full vaccination (3-dose) had a lower adjusted odds ratio (OR) of 0.72 (95% confidence interval [CI] 0.63–0.82) (Kim et al., 2016, p. E284). Those who had the 2-dose HPV vaccination had adjusted OR of 0.50 (95% CI 0.30–0.85) (ibid). It is important to mention that with the difference between the 3-dose and 2-dose not being very significant, the 2-dose schedule is widely adopted in Canada as a more cost effective approach (Goyette et al., 2021). The HPV vaccination policymaking process in Canada is distinct as the different provinces and territories developed their vaccination programs independently. Immunization programs in Canada are thus varied depending on the actors and their interests at the fore of vaccination program, can happen quickly, delayed, or stay in a state of inertia.

### **6.3 Health governance system in Canada**

Canada is the second largest country on earth with about 9.9 million km<sup>2</sup> in landmass (excluding water bodies) and spreads across six time zones. As of January 2023, it had a population of about 39.5 million people. In 1867, the country became a confederation of British North

American colonies (inclusive of New Brunswick, Nova Scotia, Quebec, and Ontario) with one intent, to bring all the colonies together. With time the confederation expanded to 10 provinces and 3 territories. The provinces and territories maintain their regional autonomy and political power is technically shared by the federal government and provincial/territorial government with the set Constitution Act, 1867 (sometimes referred to as the British North America Act, 1867). The system of governance is typical of power integration between federal departments and agencies (horizontal coordination) and between federal governments and provincial governments (vertical collaboration) (Fierlbeck, 2010, p. 2). Because of the near autonomous powers that the provinces/territories have, they can make policy decision they deem expedient to address specific issues unique to their jurisdictions. As a result, there remains variations in public policies in terms of health financing, administration, public healthcare, etc. across the provinces and territories in Canada (Marchildon, 2013). I point to near autonomy as the powers the province and territories possess are not absolute. Marchildon notes that “under certain circumstances [the federal government can] overrule provincially enacted legislation” (Marchildon, 2013, p. 11). The political power that the provinces/territories wield complement the policy responsibilities they owe to their citizens. While that is the case, the federalization in Canada brings a united policy front whereby the collective public good and goals of the nation is a point of interest for all policies (Richard, 2005). The country’s political system is modelled on the British parliamentary systems (a.k.a. Westminster system).

Historically, Canada’s health governance has been managed within two spaces of governance: the federal government having health policy oversight role and the provincial and territorial governments maintaining control of healthcare delivery (Marchildon, 2013; Tuohy, 2003). The provincial/territorial control of healthcare delivery put into consideration healthcare

design, implementation, and management (Ianni Segatto et al., 2020, p. 254). Efforts by the federal government to provide advance healthcare for its people is complex because of the differences in the federal and provincial power structure and its interpretation in the 1867 Canadian Constitution Act (Flood et al., 2017, p. 1). To this, healthcare delivery and financing in Canada is adjudicated by the judicial system to interpret this provision (ibid).

The provinces/territories have jurisdictional oversight when it comes to healthcare delivery under the 1867 Constitutional Act, which mandates provinces/territories to have direct authority over aspects of health such as the establishment, maintenance, and the management of health institutions, and the power to regulate health professionals such as doctors and nurses (Flood et al., 2017). This resonates with Fierlbeck's point that, to appreciate the "interdependent nature of modern governance", public health administration very much characterizes this (Fierlbeck, 2010, p. 2). Expression of this function is demonstrated by the PHAC, a federal agency that continuously coordinates among federal agencies at the lateral level, while vertically collaborating with provinces and territories on health-related issues.

Undoubtedly, differences in health delivery approaches exist across the nation. Due to the variations in public health policy among the provinces/territories, there is a continuous attempt to level these differences to ensure consistency in provincial/territorial health policies (Fierlbeck, 2010, p. 6). Even though the provinces/territories have significant power on health delivery, jurisdictionally, public health in Canada can be generally considered a shared responsibility among the provinces and territories and the federal government. This intergovernmental cooperation, otherwise, collaboration, expresses a policymaking synergy and the dynamism within which policy networks formed. In a broader sense, it reflects Canada's governance diversity and policymaking processes that aim to improve how public problems are solved. Within this ideal of federal-

provincial/territorial collaborative power leveraging in governance and policymaking, the problem of trust can arise especially when views shared, or solutions proposed by one arm of government are not acceptable or consistent with the position or views of the other. Competing interests can sometime arise from power differentials, which can be subtle (Luhmann, 2018; Seligman, 2021). For this reason, transparency and trust building in leveraging power within a policy or a decision-making process must be well calibrated.

Canada has a robust nationwide healthcare system with decentralized universal coverage (Medicare) under the 1984 Canada Health Act (CHA), which is financed by provincial/territorial insurance plans with federal contributions. The Act ensures access to health based on need and not on ability to pay for healthcare (Martin et al., 2018, p. 1718). The CHA operates under the five core principles of public administration, comprehensiveness, universality, portability, and accessibility. The federal government makes funds available to the provinces/territories for their healthcare expenditure through the Canada Health Transfer. To qualify, the provinces/territories must adhere to the core five principles of the CHA. While the CHA does not dictate how provinces/territories plan their healthcare insurance, it requires that they make provision to cover medically required or medically necessary hospital, physician, and surgical services (Vayda, 1986; Vayda & Deber, 1984). While the provinces and territories assume the broader public responsibilities for health delivery, private (for-profit and not-for-profit) entities have also been engaged in some specified areas of health delivery (Marchildon, 2013, p. 1). It is estimated that about 70% of health expenditure is provided for by provincial/territorial health insurance while private entities are responsible for the remaining 30%, covered by private insurers or out-of-pocket (ibid).

#### **6.4 Vaccination program in Canada**

According to Shefer and colleagues, when it comes to a national immunization program, a couple of factors must be in place to get it going: “1) establishing national recommendations; 2) assuring education of and acceptance by the public and medical community; 3) establishing and maintaining an appropriate infrastructure for vaccine delivery; 4) financing the vaccine and the program, in addition to political will” (Shefer et al., 2008, p. K68). In Canada, immunization programs are principally developed by the provinces and territories, and there is no national mandatory immunization policy. For example, there is no national policy that regulates vaccination in schools or workplaces, and in cases where this has been proposed, it has been challenged if exemptions are not made to allow people the freedom of choice (Erickson et al., 2005; Mackay, 2002).

Aside from occasional financial support, the federal government focuses on ensuring regulatory requirements for vaccines are met. For this purpose, Health Canada’s Biologic and Radiopharmaceutical Drugs Directorate (BRDD), a.k.a. Biologics and Genetic Therapeutics Directorate (BGTD), regulates and authorizes vaccines for sale in Canada once the review and scientific assessment of vaccine quality, efficacy, and immunogenicity have been established (Shefer et al., 2008; Skinner, 2020). Before a vaccine is approved by Health Canada, BRDD will conduct a series of tests and critically review the package submitted by the manufacturer to confirm the safety and efficacy profile indicated in the submission package. If the directorate is satisfied, Health Canada will issue a Summary Basis of Decision, which will include a Notice of Compliance and a Drug Identification Number to the manufacturer (Health Canada, 2021). These documents all together become the licensure for the manufacturer to sell the vaccine in Canada. Technically, the entire process can take several months before a vaccine gets to the approval stage.



In 2003, the National Immunization Strategy was birthed with federal seed funds of \$45 million to develop schemes to assess new vaccines and prioritize them for public immunization programs (Halperin & Pianosi, 2010, p. 88). As part of the strategy, the 'Erickson-de Wals framework' was developed to efficiently assist in the evaluation and decision-making process for vaccine acceptability and in program development (see table 6 for the Erickson-De Wals Framework for assessing Canadian immunization programs). Once a vaccine is approved for sale in Canada, the price of the vaccine is regulated by the federal government's Patented Medicine Prices Review Board (PMPRB). While this is the case, there is no requirement for provinces and territories to purchase any vaccine recommended by the federal government. For the most part, however, vaccines are generally purchased in bulk through a Bulk Procurement Program (BPP). This is conducted through protocols under the Public Services and Procurement Canada, where processes of price negotiation, and supply contracts are awarded through tendering on behalf of the provinces and territories (Skinner, 2020). The provinces and territories are not obligated to join the BPP, however, joining the BPP provides value and or/cost effectiveness for the provinces/territories that join. This allows the provinces/territories to make significant savings on vaccine purchase overall. To ensure supply, accountability, and fairness, the BPP is managed by the Vaccine Supply Working group under the Canadian Immunization Committee (CIC). The CIC is a joint federal, provincial, and territorial body of experts that makes decisions on whether the federal government should publicly fund a vaccination program based on factors such as cost effectiveness, cost of program implementation etc. Hierarchically, CIC reports to the Communicable Disease Control Expert Group, which also reports to the Public Health Network Council (PHNC). PHNC then reports to the Conference of Deputy Ministers of Health. Once a national vaccination program is in place, Health Canada through PHAC, under the National

Advisory Committee on Immunization (NACI), gains oversight over vaccination programs across the country and provides advice on vaccine use in Canada (Halperin & Pianosi, 2010; Mah et al., 2011; Skinner, 2020; Goyette et al., 2021b).

**Table 6: Erickson-De Wals Framework for assessing Canadian immunization programs<sup>9</sup>**

<b>Criteria</b>	<b>Key Questions</b>	<b>Responsibility</b>
Burden of disease	Does the burden of disease justify a control program?	NACI
Vaccine characteristics	Do the characteristics of the vaccine permit implementation of an effective and safe immunization program?	NACI
Immunization strategy	Is there an immunization strategy which allows goals of the control program as well as sanitary and operational objectives to be attained?	NACI/CIC
Cost-effectiveness	Is it possible to obtain funding for the program and are cost effectiveness indices comparable to those of other healthcare interventions?	CIC
Acceptability	Does a high level of demand or acceptability exist for the immunization program?	CIC
Feasibility	Is program implementation feasible given existing resources?	CIC
Ability to evaluate	Can the various aspects of the program be evaluated?	CIC
Research questions	Have important research questions affecting implementation of the program been adequately addressed?	NACI/CIC
Equity	Is the program equitable in terms of accessibility of the vaccine for all target groups?	CIC
Ethical considerations	Have ethical considerations regarding implementation of the immunization program been adequately addressed?	CIC
Legal considerations	Have legal concerns regarding implementation of the immunization program been adequately addressed?	CIC
Conformity of programs	Does the planned program conform to those planned to be implemented elsewhere (other regions, countries)?	CIC
Political considerations	Will the proposed program be free of controversy and or/produce some immediate political benefit?	CIC

It is, however, important to point out that Canada does not have a uniform parametric approach for evaluating immunization policy, such as “methods for coverage assessment, operationalized measurements for calculating cost-effectiveness to introduce vaccination, methods for tracking vaccine hesitancy, etc.” (Song, 2018, p. 149). This has fostered policy variability for

<sup>9</sup> Erickson, L. J., De Wals, P., & Farand, L. (2005). An analytical framework for immunization programs in Canada. *Vaccine*, 23(19), 2470-2476.

several vaccines approved and recommended by NACI among the provinces and territories. For example, HPV vaccines were initially slated for girls only in some provinces (including Ontario). Prince Edwards Island, on the other hand, bundled HPV vaccine for both boys and girls much earlier in their vaccination program. This is also reflective in vaccination schedules for the same vaccine among the provinces and territories (Shapiro et al., 2015; Shapiro, 2018).

A recent study that compares the policy environments for vaccines in Canada, Australia, United Kingdom, New Zealand, and the United States using the parameters of regulatory approval, health technology assessment, and procurement and funding concluded that, “Canada's process for approving and covering new vaccines under publicly funded immunization programs is among the more complex” (Skinner, 2020, p. 11). Understanding the policymaking process for the HPV vaccination program in Canada will provide insights into how decision makers prioritize and allocate resources and what informs the decision-making process.

## **6.5 HPV vaccination policymaking**

On December 12, 2005, Merck submitted Gardasil<sup>®</sup> to Health Canada for market authorization. Seven months after, on July 10, 2006, Gardasil<sup>®</sup> received market authorization in Canada and by the end of 2010, all Canadian provinces and territories implemented some form of publicly funded school-based HPV vaccination program for girls.

The approval process for Gardasil<sup>®</sup> was noticeably fast as it was given priority review status on the grounds that Gardasil<sup>®</sup> “provided effective prevention of a disease or condition for which no drug is presently marketed in Canada” (Navaneelan, 2012; Health Canada, 2021). Evidence for this was based on 12 clinical studies. Four of these were considered pivotal while the remaining eight were considered non-pivotal. The four pivotal used placebo-controlled, doubled-blind,

randomized phase II and phase III trials that profile the vaccine's efficacy (Koutsky et al., 2002; Villa et al., 2005; Garland, 2007; Garland et al., 2007).

**Table 7: A summary of HPV policymaking journey in Canada**

No	Process	Timeline
1	Canada Human Papillomavirus Vaccine Research Priorities Workshop was organized by PHAC	November 17-18, 2005
2	HPV vaccine identified as a public health intervention requiring priority in program and implementation	December 2005
3	Merck submit Gardasil® to Health Canada for market authorization	December 12, 2005
4	HPV Vaccine Expert Working Group (CIC-NACI) inaugurated	May 2006
5	Health Canada grants market authorization for Gardasil®	July 10, 2006
6	NACI makes public announcement about HPV vaccine	February 1, 2007
7	Ontario Standing Committee on Finance and Economic Affairs voted against HPV vaccination program in the province	February 22, 2007
8	A \$300M HPV Immunization Trust is announced by the federal government	March 2007
9	Health Canada presents a report on rationale for authorizing Gardasil®	March 16, 2007
10	PHAC publishes literature review of HPV and HPV vaccine	June 2007
11	Some provinces (including Ontario) began provincial vaccination programs	September 2007
12	CIC makes recommendations for HPV immunization program	December 2007
13	Remaining provinces (NB, PQ, MB, SK, AB & BC) began provincial vaccination programs	September 2008
14	Health Canada grants GSK market authorization for its vaccine Cervarix®	February 2, 2010

The policymaking process surrounding Gardasil® acceptability in provincial and territorial immunization programs is interesting and unique to each region; thus, producing varying outcomes. Prior to Merck even submitting Gardasil® to Health Canada for market authorization, a series of workshops on HPV vaccine and vaccination were already in underway. For example, from November 17-18, 2005, an HPV Vaccine Priorities Workshop was held with 53 Canadian and international HPV experts and researchers in the areas of vaccines, cancer, and sexually transmitted infections to assess the status of HPV vaccine research in Canada and elsewhere. The organizers – PHAC, Canadian Association for Immunization Research and Evaluation (CAIRE), and the Canadian Institutes of Health Research (CIHR)'s Institute of Infection and Immunity and the Institute of Cancer Research – hoped the workshop would provide Canada with a panoramic

view of its policy needs and develop strategies to prioritize research areas before the vaccine was approved by Health Canada (Dawar et al., 2007; Lippman et al., 2007; Navaneelan, 2012). One of the key observations made at the workshop was that Canada needed to answer “many questions” posed during the workshop, before the new vaccine could be justifiably administered publicly (Navaneelan, 2012, p. 42).

**Box 1: Some of the research questions raised during the Canadian HPV vaccine priorities workshop**

1. Most efficient way to deliver an HPV vaccination program?
2. Knowledge, attitudes and beliefs and acceptability of HPV vaccination programs in recipients, providers, parents?
3. Vaccine program delivery costs?
4. Immunogenicity of two-dose HPV vaccine schedule?
5. Impact of vaccination programs on cervical screening programs?
6. How to promote HPV vaccine in an acceptable and effective way?
7. Co-administration with other vaccines and effect on safety and immunogenicity?
8. Economic burden of HPV-related diseases and conditions in Canada?
9. Efficacy/effectiveness of a two-dose HPV vaccine schedule?
10. As vaccine programs progress, what will be observed with cervical screening programs?

Because the provinces and territories take responsibility for their immunization programs, program design, implementation, and the policymaking process, nothing obligates them to adhere to any recommendations from NACI. This provincial and territorial autonomy led to inconsistencies in immunization program effectiveness, vaccine uptake and coverage, and evaluation. For example, while Ontario and Newfoundland and Labrador were the first to begin a provincial HPV vaccination program for school going girls in 2007, the uptake rates were far apart (48% and 83.7% respectively). By 2015, the reported coverage for Ontario sat at 61% while that of Newfoundland and Labrador was reported as 92%. See table 8 below for coverage differences among the regions in Canada.

While some provinces maintained a steady coverage rate over the years, others like Saskatchewan declined or nearly plateaued in the same period. It is important to mention that while the federal government financially incentivized provincial and territorial governments to include the HPV vaccine in their public health programs through the \$300M HPV Immunization Trust, it did not exert active influence in vaccine program development at the provincial and territorial level. The implementation of universal HPV vaccination programs across the country has been touted as “[o]ne of the biggest successes in Canadian immunization (*sic*) immunization programs” (Halperin & Pianosi, 2010, p. 87). Gardasil® has been well promoted within university campuses with large banners hanging in high student traffic areas like student centres promoting “the message that young women could and should take action to reduce the transmission of HPV by having the vaccine” (Wyndham-West, 2016, p. 61). According to Wyndham-West, the bedrock of the federal government’s HPV vaccination policy gained traction given its “focus on women as the main at-risk group” (Wyndham-West, 2016, p. 60). This assertion has been referred by some as the “feminization of HPV” resulting in “direct and indirect gender biases and corresponding inequities for HPV-related diseases” (Daley et al., 2017, p. 142).

It is reported that the cost per life year saved in the HPV vaccination of 12-year-old girls in the school-based immunization program is \$12,921 (Skinner, 2020, p. 2). While Canada performs relatively well compared to other OECD countries in HPV vaccination coverage, the differences in HPV vaccination coverage in the 13 provinces and territories is indicative that there are underlying factors, such as differences in policy and program implementation, prioritization, public awareness and knowledge, and vaccine hesitancy, among many other factors contributing to public acceptance. Table 8 shows the differences in coverage across Canada.

**TABLE 8: PRIMARY SCHOOL-BASED HPV VACCINATION COVERAGE RATES AMONG CANADIAN PROVINCES AND TERRITORIES (DATA FOR GIRLS ONLY)\***

Province/Territories	Grade	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
British Columbia	Grade 6	N/Av	61.90%	59.90%	64.30%	68.70%	68.80%	65.80%	64.80%	67.10%	66.50%	66.90%	66.10%
Alberta	Grade 6	N/Av	54.2	55.70%	58.60%	59.90%	62.20%	62.60%	64.20%	63.90%	63.60%	68.20%	N/Av
Saskatchewan	Grade 6	N/Av	74.50%	76.60%	72.70%	73.50%	72.80%	68.70%	61.40%	69.10%	69.10%	N/Av	N/Av
Manitoba	Grade 6	N/Av	57.60%	57.00%	62.00%	62.70%	N/Av	67.30%	68.50%	65.00%	N/Av	N/Av	N/Av
Ontario	Grade 7	48.00%	52.50%	55.20%	58.40%	70.20%	80.20%	61.50%	60.40%	61.00%	59.40%	62.40%	N/Av
Quebec	Grade 4	N/Av	81.00%	76.00%	78.00%	77.00%	78.00%	77.00%	74.00%	73.00%	76.00%	77.00%	79.00%
New Brunswick	Grade 7	N/Av	72.80%	71.20%	73.00%	75.80%	75.10%	73.00%	73.50%	75.40%	74.70%	74.80%	74.90%
Nova Scotia	Grade 7	N/Av	77.1	59.80%	74.80%	76.10%	77.20%	75.00%	75.60%	80.80%	73.40%	N/Av	N/Av
Prince Edward Island	Grade 6	N/Av	81.10%	N/Av	N/Av	85.10%	87.30%	84.90%	82.70%	84.30%	88.40%	86.40%	84.00%
Newfoundland & Labrador	Grade 6	83.70%	88.20%	84.60%	90.60%	86.10%	94.30%	88.70%	89.20%	92.00%	N/Av	N/Av	N/Av
Yukon	Grade 6	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	66.5	N/Av	N/Av
Northwest Territories	Grades 4-6	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	39.3	N/Av	55.00%	N/Av	N/Av	N/Av
Nunavut	Grade 6	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av

\*Data sourced from: Goyette, A., Yen, G. P., Racovitan, V., Bhangu, P., Kothari, S., & Franco, E. L. (2021). Evolution of Public Health Human Papillomavirus Immunization Programs in Canada. *Current Oncology*, 28(1), 991-1007. Note: N/Av= Not Available

## **6.6 The HPV vaccine policymaking process in Ontario**

Literature on how provinces and territories in Canada made their policy decision pre-federal funding for the national HPV vaccination program is not plentiful. While this is the case, Ontario, as the most populous province, may provide a glimpse of how decision-makers were thinking about the HPV vaccination programs.

Health policymaking processes in Ontario are of particular interest as the policy environment is generally nondirectional and multifaceted with different actors pushing and pulling stakes of interest to produce policy ideas and shifting positions until finally converging with the policy program desired. Ontario presents diverse actors, some of whom can mobilize substantial resources and use diverse levels of political and economic influence to determine the course of the policymaking process. For example, while NACI, under the auspices of the Federal Ministry of Health in February 2007 released a statement on the efficacy of Gardasil® based on published clinical trial results, Ontario was not ready to prioritize or allocate resources for Gardasil® uptake or a vaccination program. On February 22, 2007, the Ontario Standing Committee on Finance and Economic Affairs voted against an HPV vaccination program in the province after a member of the committee raised concerns in two critical areas that needed to be settled. Firstly, the cost of the vaccine, and secondly to get recommendation/directives from CIC prior to developing any plan/program (Navaneelan, 2012, p. 49). On March 1, 2007, however, the federal government announced a \$300 million dollars HPV Immunization Trust for HPV vaccination program for 1.7 million girls across Canada. This commitment from the federal government quickly redefined the entire outlook on Gardasil® acceptability among governments as it paved the way for some provinces to begin plans for developing vaccination programs.



The speedy priority setting and resource allocation of \$300 million for HPV vaccination programs raised concerns among some actors. For example, Lippman and colleagues raised concerns about the speed at which the vaccine was being moved from one level of the bureaucratic table to the other in a hurry to get young girls vaccinated across the country. Lippman asked "What's the rush? Why can't we get the information that we need first?" (CBC News, 2007). Lippman and colleagues had concerns around the safety of the vaccine considering that only 1,200 girls between the ages of 9 to 15 were enrolled during clinical trials (Lippman et al., 2007, p. 485). The argument put forward was that the information from the clinical trials was scanty and insufficient to support a policy to mass vaccinate all girls aged 9-13. Another critical point of doubt was that the vaccine is the "most expensive" proposed for mass use at a cost of \$404 for the 3-dose schedule (ibid). In concluding remarks, Lippman and colleagues pointed out that Canada does have "thoughtful and useful frameworks for developing vaccination and cancer prevention policies" which must be utilized to collect enough information "before [the] governments allocate huge sums of already limited healthcare dollars to such programs" (Lippman et al., 2007, p. 486). Women's groups and other impacted actors were also not consulted in the process and this became a point of concern to some actors (Gramet-Kedzior, 2009, p. 9). Gramet-Kedzior notes that, in March 2007, Merck was speculated to have been lobbying federal cabinet members, potentially leading to the hasty decision by the government to make available \$300 million without much deliberation (Gramet-Kedzior, 2009, p. 10). It is also noted that, while there is no open participation of Merck in the policymaking or decision by government to pledge \$300 million for the vaccination program, a former staffer of the then Prime Minister (Stephen Harper), Ken Boessenkool, who worked as a lobbyist for the lobbying firm Hill+Knowlton, and also had links to Merck, generated a point of heated debate in the House

of Commons on April 17, 2007 (Wyndham-West, 2016, p. 22). The debate on the role of Boessenkool spilled over into the mainstream media at the time, sustaining the assertion that Merck was heavily engaged indirectly in the HPV vaccination program.

To understand the role of the vaccine manufacturer's interest in government affairs, an undated Merck Canada Inc. document posted online, indicated the vaccine manufacturer's desire to support the "pre-budget consultation process of the House of Commons Standing Committee on Finance for the 2018 Federal Budget" (Merck Canada Inc, n.d.). In the report, Merck highlighted the contribution it makes to the Canadian economy, with about \$60 million in R&D in 2016 alone. Merck pointed to its leadership in "major improvements in health outcomes" such as being the first to discover vaccines for diseases such as measles, mumps, and HPV (ibid). While the report touted that "investing in vaccines is both the right thing to do from a health population perspective and the smart thing to do from a fiscal management perspective," it equally pushed forward that the 2018 budget was "an excellent opportunity" for the federal government to expand "its current HPV immunization program" (ibid). This will connect the dots as, in retrospect, Merck may have influenced the federal government to allocate the \$300 million for the national HPV vaccination program with little doubt. When it comes to access to vaccines, the actions of the actors involved and their inherent interests, the type and source of power they wield, their resources, and how these actors are organized must not be taken for granted. Undeniably, Gardasil<sup>®</sup> has been recognized as one of the most heavily marketed and lobbied vaccines in the history of vaccines (Herper, 2012). The economic advantage for Merck to work with governments in promoting the vaccine is in line with conventional pharmaceutical industry marketing strategy (Wailoo et al., 2010; Tomljenovic & Shaw, 2013).

Wyndham-West pointed out that leaving public health issues to be debated within the “context of a federal Standing Committee on Finance and not within a health forum” is ‘disconcerting’; one that leads “to the increased corporatization of health policy” (Wyndham-West, 2016, p. 24). She further asserted that when it comes to HPV vaccination policymaking in Canada, “research on the prevalence, awareness, knowledge of or beliefs about HPV in Canada” was scanty (Wyndham-West, 2016, p. 26). This implies decision making on the HPV vaccination was a rather reactive response rather than heavily thought through. Even though the Ontario Standing Committee on Finance and Economic Affairs was the first provincial body to vote against an HPV vaccination program, events changed as the province received \$39 million from the \$300 million federal trust. Six months after the federal trust was instituted, Ontario successfully became one of the first provinces to roll-out Gardasil® for primary school girls in September of 2007. Ontario’s HPV vaccination program took off without resolving the earlier concerns raised by the Standing Committee on Finance and Economic Affairs. To understand the HPV vaccine policymaking process and the HPV vaccination program, and what informed the decision, considering that the Standing Committee did not subscribe to allocating provincial funds for HPV vaccination program earlier, a scoping review is conducted to further this study.

## **6.7 Methodology**

The literature on HPV vaccination in Canada is broad covering areas such as policy, vaccination uptake, cost effectiveness analysis, etc. To understand the priority setting and HPV vaccination policymaking process in Ontario, a scoping review was performed to produce a coverage of publications on the HPV vaccination policymaking, policy/program in Ontario. Identified publications from the scoping review are analysed for interpretation of the policymaking process under five thematic areas: 1) policymaking approach, 2) actor influence in

vaccine policymaking, 3) cervical cancer prioritization/ women's health priority setting 4) vaccine purchase negotiation, vaccine introduction, and 5) the right to health. A convergence or divergence in the themes is analysed and discussed.

## **6.8 Scoping review**

A scoping review is selected for this purpose because it allows researchers to analytically reinterpret the literature (Davis et al., 2009; Levac et al., 2010). The scoping review process also allows researchers to effectively summarize and disseminate research findings or identify gaps in the existing literature (Arksey & O'Malley, 2005; Levac et al., 2010). For this purpose, the Arksey & O'Malley scoping review approach is utilized. The Arksey & O'Malley scoping review framework involves (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data, and (5) collating, summarizing, and reporting the results. An optional consideration in the framework is consultation for suggestions of additional references and insight beyond those in the literature scoped.

## **6.9 Identify research question**

The objective of this scoping review is to identify publications that focus on HPV vaccination policymaking in Ontario. To establish and identify publications for this purpose, the research question is what governmental, private sector, societal and scientific factors contributed to and influenced HPV vaccination policymaking process in Ontario?

## **6.10 Identifying relevant studies**

Google Scholar, ProQuest, and PubMed were searched for publications written in the English language from the period of January 2007-December 2020 using the search theme "HPV vaccination policymaking in Ontario." The rationale for selecting this search window is because while the HPV vaccine, Gardasil®, was approved in 2006 by the FDA in the USA, the vaccine

received market authorization in Canada in 2007. The search was conducted from November 13, 2021, to December 3, 2021. A consideration was made to search the selected databases from the beginning of 2007 up to the last month of 2020, to cover full years. For each database, the search words were “HPV vaccination policymaking in Ontario”.

## **6.11 Study selection**

### ***6.11.1 Exclusion criteria***

Firstly, publications that were outside the jurisdiction of Canada or within Canada but did not focus on Ontario policymaking processes were excluded. Secondly, publications that focused on policymaking in Ontario but did not focus on the HPV vaccination program were also excluded. Thirdly, publications that focused on cervical cancer however did not focus on the policymaking process of HPV vaccination in Ontario were eliminated.

### ***6.11.2 Inclusion criteria***

Publications with the keywords cervical cancer, HPV (or Human papillomavirus), policy, policymaking, decision-making, decision making, plan, program, programme, programmatization, vaccines, vaccination, prioritization, priority setting; prevention and control in the abstract and conclusion were accepted as meeting the first stage of inclusion criteria. Publications that met the first stage inclusion criteria were tabulated and categorized according to article name, keywords, authors, journal, publication year, country of author(s), key themes in abstract, included/ excluded, and rationale for decision.

## **6.12 Charting the data**

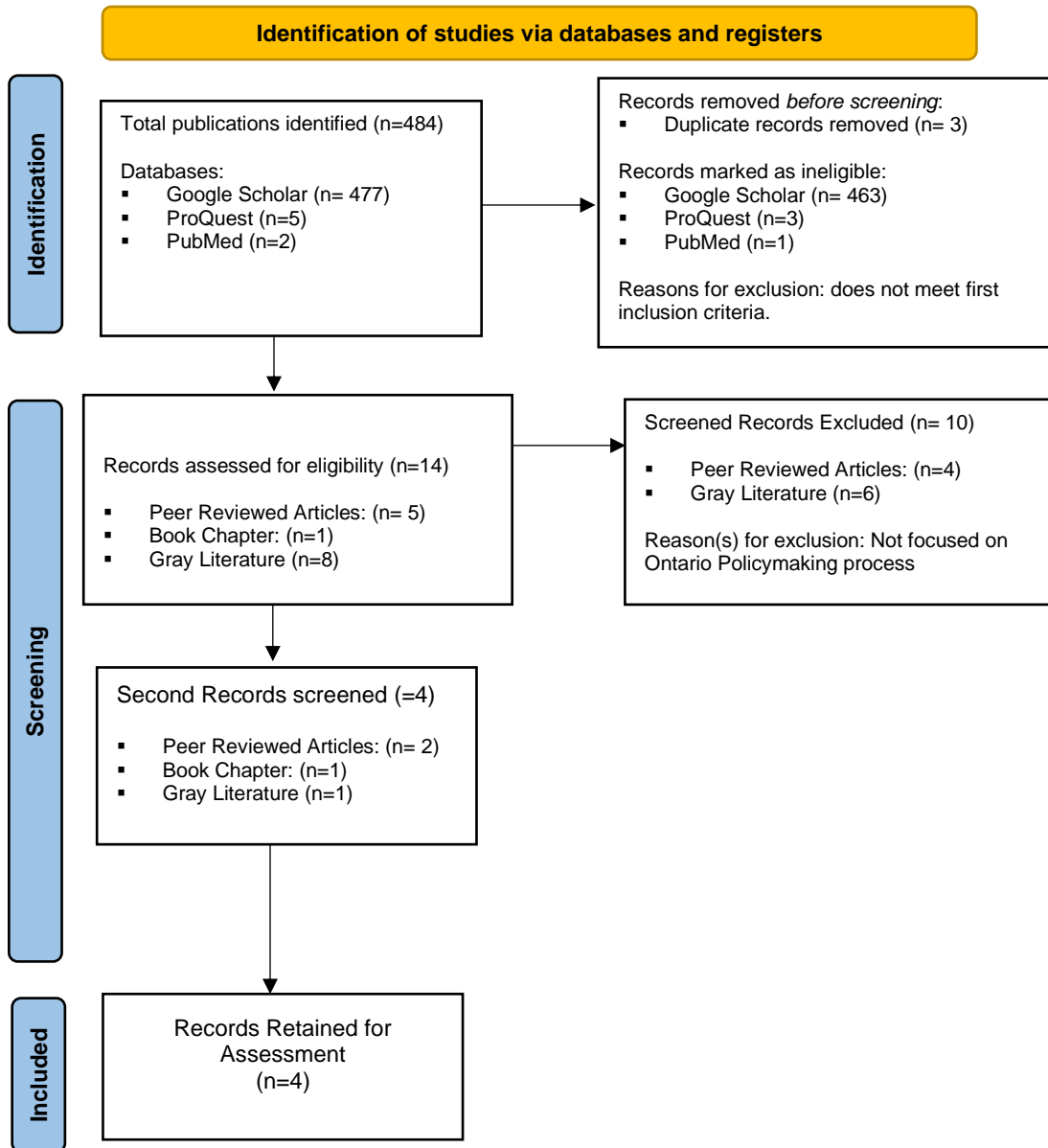
The table capturing the data was updated contemporaneously for every search to include publications that met the first stage inclusion criteria. The second stage inclusion criteria were executed to remove articles that did not have relevance to the Ontario HPV policymaking process.

### **6.13 Collating, summarizing, and reporting the results**

The search phrase “HPV (Human Papillomavirus) vaccination policymaking Ontario” was entered into Google scholar search engine, and 477 articles were retrieved. Using the exclusion criteria, 463 publications were removed. In PubMed, 2 articles were retrieved upon entering the search phrase “HPV (Human Papillomavirus) vaccination policymaking Ontario”. Only 1 publication met the first stage inclusion criteria. For ProQuest, an advance search using the theme “HPV (Human Papillomavirus) vaccination policymaking Ontario” was entered. “Anywhere” was selected as the location along with full text from January 01, 2007-December 31, 2020. For document source type, “scholarly journals, reports, newspapers, government, and official publications” were selected. For Document type, “article” and “case study” were selected. Finally, “English” was selected for language. 5 publications were retrieved by this search iteration of the database.

Three publications were duplicated and thus removed. In total, 467 articles were excluded because they did not meet the first stage criteria for eligibility selection. Only 14 publications met the first stage of eligibility criteria. Four peer reviewed publications and 6 grey publications (thesis) that met the first stage eligibility criteria were excluded because they did not specifically focus on the Ontario HPV vaccination policymaking process. Because Canada’s immunization policymaking is principally conducted within the jurisdiction of the provinces and territories, the different policymaking outlooks will present diverse views. One peer reviewed publication, one book chapter, two grey documents (thesis) publications that met the first stage eligibility selection also met the second stage eligibility criteria and were included/retained for analysis (see figure 3).

**Figure 3: Database Search for Ontario HPV Vaccination Policymaking**



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71

**TABLE 9: DATA CHARTING**

Article Name	Key words	Authors	Journal	publication Year	Country of Author(s)	Key themes in Abstract	Included/ Excluded	Rationale for Decision
Power and culture in emerging medical technology policymaking: the case of the human papillomavirus (HPV) vaccine in Canada	Emerging medical technologies; HPV vaccine; Co-production of power and culture; Sensemaking; Neoliberalism	Michelle Wyndham-West, Mary Wiktorowicz, Peter Tsasis	Evidence & Policy	2016	Canada	How scientific uncertainty is negotiated; How policymakers engage in 'sensemaking'; Policymakers mediate shifting informational terrain	<b>included</b>	Focuses on HPV vaccine (Gardasil®) policymaking in Ontario.
School Based HPV Vaccination for Girls in Ontario. In " <i>population and public health ethic: Cases from research, policy, and practice</i> "	Not listed	Alison Thompson and Jessica Polzer <i>Case discussion by Laura Shanner</i>	<b>Book Chapter:</b> University of Toronto Joint Centre for Bioethics	2012	Canada	Ontario program frames the product as a cervical cancer vaccine not an STI vaccine; The program deliberately conflates HPV infection with cervical cancer to create the perception of a public health crisis	<b>included</b>	Focuses on the framing and ethical justification for HPV vaccination program in Ontario HPV policymaking.
'It's really complicated': How Canadian university women students navigate gendered risk and human papillomavirus (HPV) vaccine decision making	Risk; Gendered risk; Identity-driven decision-making; HPV vaccine; Sexual health negotiation; Canada; Women university students; Ethical agency	Michelle Wyndham-West	Health, Risk & Society	2016	Canada	promotion of human papillomavirus (HPV) vaccine.	excluded	Focused on how university students in Ontario make decision on whether to have the HPV vaccine or not; after the policy is in effect, thus excluded.
Vaccines policy in Canada: International and Domestic Comparisons	Not listed	Brett J Skinner	Canadian Health Policy	2020	Canada	Canada's process for approving and covering new vaccines under publicly funded immunization programs.	excluded	compares the policy environments for vaccines in Canada, Australia, United Kingdom, New Zealand, and the United States. Not focused on the Ontario HPV vaccine policymaking process, thus excluded.
Another look at the human papillomavirus vaccine experience in Canada.	Not listed	Catherine L. Mah, Raisa B. Deber, Astrid Guttmann, Allison McGeer,	American Journal of Public Health	2011	Canada	policy process surrounding the adoption of the human papillomavirus (HPV) vaccine in Canada. public good arguments continue to	excluded	Not focused on Ontario policymaking process, thus excluded.



**TABLE 9: DATA CHARTING**

Article Name	Key words	Authors	Journal	publication Year	Country of Author(s)	Key themes in Abstract	Included/ Excluded	Rationale for Decision
		and Murray Krahn				dominate immunization policymaking. actors framed HPV vaccination as a personal— rather than a public—matter. collective immunization programs in the policy discourse		
Canadian school-based HPV vaccine programs and policy considerations	Canada, Cancer prevention Human papillomavirus Immunization policy School-based vaccination programs Vaccination coverage	Gilla K. Shapiro Juliet Guichon Margaret Kelaher	Vaccine	2017	Canada	school-based HPV vaccination pro-gram administration and vaccination rates. identifies foreseeable policy considerations.	excluded	Focus is on HPV vaccination coverage in Canada and not on the policymaking process, thus excluded.
“In the end, it’s your pleasure that’s on the line”: Postfeminist, healthist, and neoliberal discourses in online sexual health information	Thesis (PhD)	Laura Cayen	University of Western Ontario	2016	Canada	Make the right choices in the pursuit of good sexual health; young women are mobilized to manage sexual health risks	excluded	Not focused on Ontario policymaking process, thus excluded.
A Novel Approach to Guide Health Promotion Planning for Preventive Human Papillomavirus (HPV) Vaccination Among Adolescent Girls in an Ontario Public Health Unit	Thesis (M.Sc.)	Lisa RAM bout	University of Ottawa	2012	Canada	Guide health promotion planning for HPV vaccination. recommendations for guiding principles, research, intervention development, and health policy	excluded	The thesis chapter under this review is 5.0. This chapter addresses approaches to promote HPV vaccination among adolescents in Ontario, and not policymaking process, thus excluded.

**TABLE 9: DATA CHARTING**

Article Name	Key words	Authors	Journal	publication Year	Country of Author(s)	Key themes in Abstract	Included/ Excluded	Rationale for Decision
Is it Worth the shot? Ontario Women's Negotiations of Risk, Gender and the Human Papillomavirus (HPV) Vaccine	Thesis (PhD)	Catherine Michelle Wyndham-West	York University	2014	Canada	understanding how Human Papillomavirus (HPV) vaccine policy became gendered in Canada. how women in Ontario negotiated the concepts of "risk" and "gender". decision making about the vaccine.	included	This thesis looks at the general policymaking process of HPV vaccination in Canada with extended interest in how Ontario made the decision on province wide HPV vaccination program
Normalization and informed decision-making in public health programs: A case study of HPV vaccination in Canada	Thesis (MSc)	Tanya Navaneelan	University of Ottawa	2012	Canada	examined the evidence, policy decision-making, and implementation of HPV vaccination in Canada	included	Narrative review of federal and provincial documents and websites pertaining to HPV immunization policy in Canada.
Making Sense of social media For Public Health Decision-Makers – The Case Of Childhood Immunization In Ontario	Thesis (PhD)	Melodie Yunju Song	McMaster University	2018	Canada	understanding decision-makers' perceptions towards vaccine hesitancy and social media; provincial decision-makers' preference for addressing immunization	excluded	This thesis does not delineate the HPV vaccination policymaking process in Ontario, thus excluded.
Understanding human papillomavirus vaccination and vaccine hesitancy among Canadian parents	Thesis (PhD)	Gilla Kim Shapiro	McGill University	2018	Canada	Vaccines that target the oncogenic strains of HPV all Canadian provinces and territories have now implemented universal vaccination programs.	excluded	This thesis does not delineate the HPV vaccination policymaking process in Ontario, thus excluded.
The 'Gardasil Controversy' in Canada: A Study of Print Media Portrayals Preceding, Surrounding and Following Federal Investment in a National Human	Thesis (MSW)	Agathe Gramet-Kedzior	Carleton University	2009	Canada	Government officials, politicians and medical professionals supported vaccination. Catholic school boards and women's health advocates were opposed.	excluded	The thesis delineates the condition of the \$300 million resource allocation for national HPV vaccination program however, it does not delineate the HPV vaccination policymaking

Article Name	Key words	Authors	Journal	publication Year	Country of Author(s)	Key themes in Abstract	Included/ Excluded	Rationale for Decision
Papillomavirus (HPV) Immunization Program								process in Ontario thus excluded.
Governing Immunization in Canada	Thesis (PhD)	Catherine Ling Mah	University of Toronto	2009	Canada	Immunization requires the deployment of a wide range of the policy tools available to government.	excluded	This thesis focuses on immunization processes in Canada, however it does not delineate the HPV vaccination policymaking process in Ontario, thus excluded.

**Table 10: Included publication context extract<sup>10</sup>:**

Considerations	Wyndham-West, M., Wiktorowicz, M., & Tsasis, P. (2018). Power and culture in emerging medical technology policymaking: the case of the human papillomavirus (HPV) vaccine in Canada. <i>Evidence &amp; Policy: A Journal of Research, Debate and Practice</i> , 14(2), 277-299	Thompson, A., & Polzer, J. (2012). School based HPV vaccination for girls in Ontario. <i>Population and public health ethics. Canadian Institutes of Health Research-Institute of Population and Public Health ed. Toronto, ON: Cases from Research, Policy, and Practice</i> , 103-13	Wyndham-West, C. M. (2014). Is it Worth the shot? Ontario Women's Negotiations of Risk, Gender, and the Human Papillomavirus (HPV) Vaccine	Navaneelan, T. (2012). <i>Normalization and informed decision-making in public health programs: A case study of HPV vaccination in Canada</i> . University of Ottawa (Canada)
Policymaking Approach	Page 18: In the case of the HPV vaccine, policymakers filled in the information gaps through sensemaking – adapting to a shifting, and often contradictory, informational terrain by drawing upon their belief systems to weave a policy ‘story’ that they were comfortable with and that could serve as a springboard through which to make decisions.	Page 104: Following the pharmaceutical company’s lead, the Ontario program frames the product as a cervical cancer vaccine, not an STI vaccine. As a risk-communications strategy, the program deliberately conflates HPV infection with cervical cancer to create the perception of a public health crisis	Page 22: Ontario government announced in early August 2007, that it would offer the HPV vaccine to grade eight girls free of charge in the public school system. Government statement: “we’re providing this vaccine to women at a young age so we can help prevent the spread of HPV and save lives”.	Page 2 and 35: Normalization (the tendency towards automatic adoption of a new health intervention). Describes the situation where what is accepted as ‘normal’ emerges through repetition, familiarity, propaganda, etc.
Actor influence in vaccine policymaking	Page 14: All interviewees agreed that pharmaceutical companies have a big impact and are a key governmental stakeholder. Page 14: While there is a complex network of actors, it is clear which actors are in the centre of power. Page 18: our research also highlights how little control the government of Canada had in the policymaking process	Page 109: [T]he manufacturer is certainly a stakeholder.	Federal and Provincial government: Premier of Ontario announced program in the lobby of Women’s College Hospital in Toronto.	Page 52: HPV immunization policy was created with the engagement of a large number of actors

<sup>10</sup> Text directly from articles

<b>Considerations</b>	Wyndham-West, M., Wiktorowicz, M., & Tsasis, P. (2018). Power and culture in emerging medical technology policymaking: the case of the human papillomavirus (HPV) vaccine in Canada. <i>Evidence &amp; Policy: A Journal of Research, Debate and Practice</i> , 14(2), 277-299	Thompson, A., & Polzer, J. (2012). School based HPV vaccination for girls in Ontario. <i>Population and public health ethics. Canadian Institutes of Health Research-Institute of Population and Public Health ed. Toronto, ON: Cases from Research, Policy, and Practice</i> , 103-13	Wyndham-West, C. M. (2014). Is it Worth the shot? Ontario Women's Negotiations of Risk, Gender, and the Human Papillomavirus (HPV) Vaccine	Navaneelan, T. (2012). <i>Normalization and informed decision-making in public health programs: A case study of HPV vaccination in Canada</i> . University of Ottawa (Canada)
	concerning the HPV vaccine. the federal and provincial governments are in the middle of policy processes. With non-linear and diffuse webs of policy entrepreneurship, it is difficult to imagine how governments are able to steer policy agendas or to procure policy change in ways that do not reflect and advance private interests.			
Cervical cancer prioritization/ Women's Health priority Setting	Page 8-9: [In] August 2007 the Ontario government announced it would cover the HPV vaccine for grade eight girls in the school system: 'we're providing this vaccine to women at a young age so we can help prevent the spread of HPV and save lives' (Office of the Premier, 2007).	Page 110: The initial emphasis on prevention of cervical cancer, which is more common than HPV-related anal and throat cancers and more serious than genital warts, reflects a partly need-based approach in the Ontario program.	Page 22: promoting the vaccine for use on women/girls only and as a means to "save" them from cancer. Government statement: "we're providing this vaccine to women at a young age so we can help prevent the spread of HPV and save lives".	Page 43: The vaccine was granted Priority Review status because it "provided effective prevention of a disease or condition for which no drug is presently marketed in Canada".
Vaccine Purchase negotiation, Vaccine introduction	Page 8: Conservative government announced that \$300 million over three years would be funnelled to the provinces and territories 'to help establish a national vaccine program that will help protect women and girls from cancer of the cervix' in its April 2007 annual budget.	Page 103: It is the most expensive childhood vaccine for mass use, with a cost of \$404 for the three required doses.	Government negotiates with vaccine manufacturer, Merck, to buy vaccines.	
Right to health		Page 104: As is the case for most risks for chronic disease, risks for cervical cancer in Canada are not distributed evenly across the population. The introduction of universal Pap screening in Canada resulted in declines in cervical cancer incidence and mortality among all income groups, with the biggest reductions seen in low-income women.	Page:6, 16: HPV vaccine policy became gendered in Canada when the virus is gender blind and associated with cancer affecting individuals of all genders.	

## 6.14 Discussion

### 6.14.1 Policymaking approach

The HPV vaccine policymaking process in Ontario at its height experienced little to nearly non-existent policy resistance. The use of information from the vaccine manufacturer as a basis to establish the vaccine's "fit for purpose" to eliminate cervical cancer shapes the assessment paradigm within which policymakers must decide. This opens policymaking portals where policy makers must move between facts and contradictions and navigate through them to craft sensible policy stories. This approach of sensemaking in policymaking is uncharacteristic of Canada, or Ontario, where the policymaking process is nonlinearly fitted with diverse actors who engage core decisionmakers like governments and their agencies for accountability and value for money for policy decisions. Sensemaking normalizes automatic adoption of the new interventions (Weick et al., 2005; Seligman, 2006; Weber & Glynn, 2006; Mills, 2008). Navaneelan posits that this normalization emerges through repetition, familiarity, propaganda, etc. (Navaneelan, 2012, p. 2). Similarly, Wyndham-West and colleagues found policymakers' sensemaking led to decisions that were in their best interest as the chosen narrative tended to compel sympathy and easily evoked concerns and emotions related to cervical cancer (Wyndham-West et al., 2018, p. 18). For example, the Premier of Ontario announced, prior to the province wide HPV vaccination program, while standing in the lobby of Women's College Hospital in Toronto that, "we're providing this vaccine to women at a young age so we can help prevent the spread of HPV and save lives" (Wyndham-West, 2016, p. 22).

Sensemaking is the process of group or individual engagement that leads to the interpretation, isolation of meaning, and the creation or recreation of pathways to reflect on public problems (Weick et al., 2005; Brown et al., 2008). Rom and Eyal described sensemaking as a

time-space “context-laden” situation where a gap is created as a result of the situation and through a process of gap-bridging seek plausible “inputs” through various activities within the time-space (Rom & Eyal, 2019, p. 2). This gap-bridging rests on rational information that presents meaningful understanding and pathways for action(s) to be taken (Weick et al., 2005; Rom & Eyal, 2019). In the process of gap-bridging (i.e., solution search), a dialogic technique is employed in an environment that allows participants to be expressive of their position in and around the situation at hand (Rom & Eyal, 2019). According to Rom and Eyal, participants move between states of “certainty [simple patterns and order] and uncertainty [complexity and chaos]” in the quest to finding solution to the situation (Rom & Eyal, 2019, p. 2). We see this in how the Ontario Standing Committee on Finance and Economic Affairs voted against HPV vaccination program but later supported the program when the federal government announced the \$300 million fund for provinces and territories. This provides a rationale in making sense of fact that there was going to be no burden on the province to execute a province-wide vaccination program.

While sensemaking may sometimes create paths of disagreement among actors due to power differentials or deference that may constrain or facilitate the policymaking process, the effective framing of the policy problem, available resources to execute the policy, and normalization of the policy solution directly creates a confluence of agreement (Ibarra & Andrews, 1993; Naumer et al., 2008). This disperses power of central actors and reorganizes actors through the lens of offering a greater public good. To effectively do this requires evidence. Sources of evidence for the policymaking process are fluid and not only scientifically generated (Biller-Andorno et al., 2002; Zussman, 2003; Strydom et al., 2010; Cairney, 2014). Wherein evidence for public policy is generatable, it should be promoted to mitigate the risk of policy failure. Evidence in policymaking supports the fundamentals of policy stability and the quality of the evidence used

can be a predictor of policy success or failure. When policy is evidence-based, it is more likely to be effective, mitigate biases, likely be less expensive, provide alternative policy options, and give policymakers confidence in their decision making (Campbell et al., 2007; Strydom et al., 2010).

Evidence-based models that can quantitatively support policymaking have been built and used to effectively make policy decisions. An example is the application of mathematical models and appraisal tools for public health policymaking (Nilsson et al., 2008; Boden & McKendrick, 2017; Njeuhmeli et al., 2019; James et al., 2021). Policymakers have used consistency checks to affirm the stability of policy decision in public crisis such as flooding (Fondo et al., 2018). This has also been adopted in understanding the certainty of market players. For example, Brouwer and colleagues adopted a choice consistency and preference stability check to test the certainty and choice complexity in willingness to pay elicitation (Brouwer et al., 2017, p. 749). The authors were able to predict the degree of choice certainty and estimate the differences in choice alternatives and how this lower choice complexity among respondents (ibid). Similar estimations to determine choice stability has been developed and tested to show actors choice (Brouwer et al., 2010; Dellaert et al., 2012). Skaaning has tested that qualitative methodologies used in analysis can be quantified and assessed for their robustness and certainty (Skaaning, 2011). Skaaning point out that to test for the robustness in a comparative analysis, three areas to focus on should be 1) the calibration of raw data into set-membership values, 2) the frequency of cases linked to the configurations, and 3) the choice of consistency thresholds (Skaaning, 2011, p. 291). These kind of tools for estimating and testing choice stability and/or certainty is not devoid of challenges. For example, some test estimations have yielded controversial outcomes predicting that large differences between choices is a marker for a higher choice stability/certainty (Brouwer et al., 2010; Dellaert et al., 2012; Brouwer et al., 2017). While challenges exist with a choice

consistency/stability test, the evidence elucidated support a view that the policymaking approach that policymakers chose to apply in their decision making can be tested for certainty, robustness, and/or stability to assure confidence in the policy choice.

To strengthen policymaking processes and gauge the stability and sustainability of the policy choice, a proposal is made that adjustment in the policymaking process should include: 1) positional evidence - where the premise of a policy choice is justified and redistributive; 2) situational evidence - where the policy choice is practical, and interventional; and 3) value for money evidence - where the policy choice is proven to be cost-effective and financially sustainable. The rationale for these recommended markers is that a policy stability over its lifecycle is dependent on factors that influence its present and future value and public good outcome. To quantify this supposed policy assessment of policymaking and option selections, a simple appraisal model/tool (Table 11) to estimate the policy choice stability check in sensemaking policymaking process is suggested. The formula for estimating a policy choice stability check is given Table 11 below:

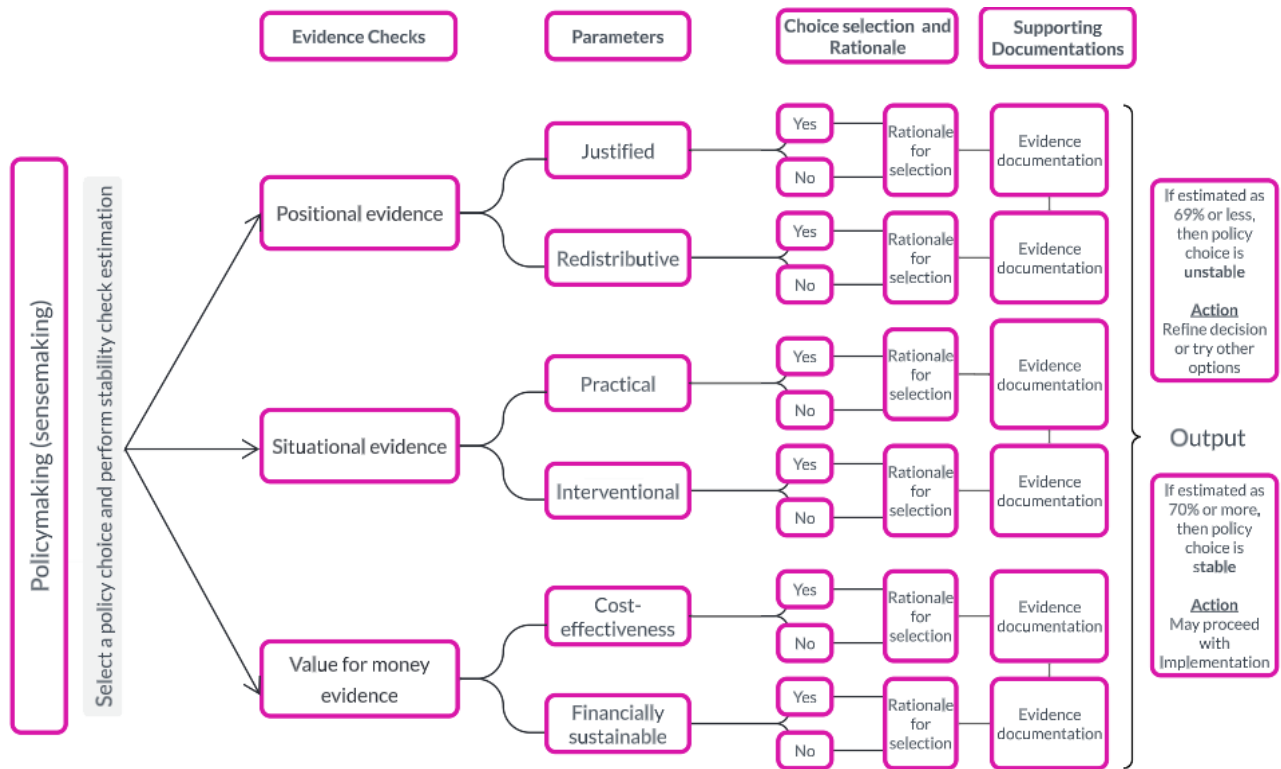
$$\text{Policy Choice Stability Check} = \frac{7 + (\text{Number of "YES" Replies} - \text{Number of "NO" Replies})}{1 + (\text{Total Selectable YES} + \text{Total Selectable NO})} \times 100$$

**Table 11: Proposed Policy Choice Stability Estimator**

<b>Policymaking Process</b>	<b>positional evidence</b>	<b>situational evidence</b>	<b>value for money evidence</b>
Sensemaking	Policy choice is: 1. Justified <input type="checkbox"/> Yes <input type="checkbox"/> No 2. Redistributive <input type="checkbox"/> Yes <input type="checkbox"/> No	Policy choice is: 1. Practical <input type="checkbox"/> Yes <input type="checkbox"/> No 2. Interventional <input type="checkbox"/> Yes <input type="checkbox"/> No	Policy choice is: 1. Cost-effective <input type="checkbox"/> Yes <input type="checkbox"/> No 2. Financially sustainable <input type="checkbox"/> Yes <input type="checkbox"/> No

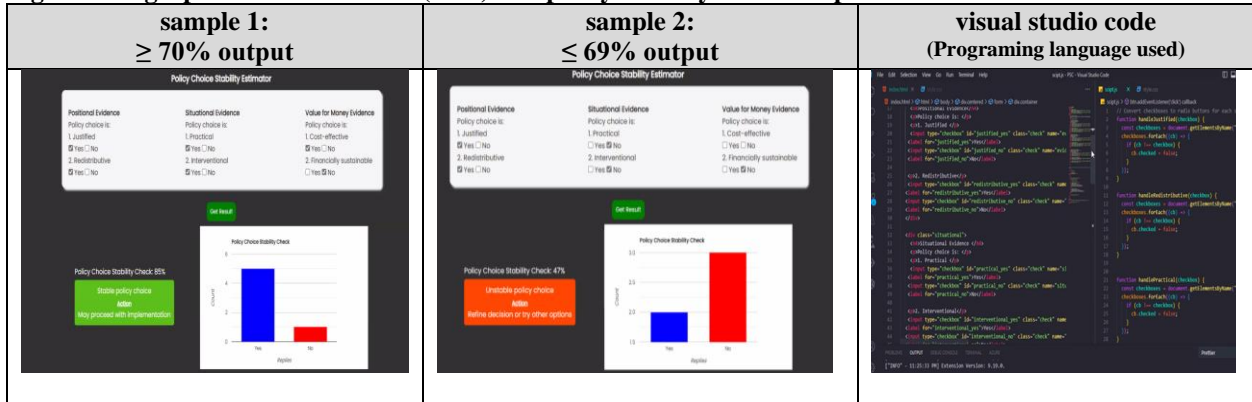


**Figure 4: Algorithmic representation of the proposed policy choice stability estimator**



Source: author developed, 2023

**Figure 5: A graphical user interface (GUI) of a policy stability choice output**



A policy choice stability check of greater or equal to 70% is indicative that the policy choice is stable on a long term, while a score less or equal to 69% signals potential instability or unsustainability of the policy choice to reach optimal benefit to public. 70% is selected because it is conservative and covers far greater area of the critical areas of public and governmental

concerns. Using this matrix as a gauge to estimate the stability and sustainability profile of Ontario’s sensemaking policymaking process, an assumption is made that the literatures reviewed for this work have justly delineated the policymaking process in Ontario. From that perspective, the decision made by the Ontario government is estimated to be 85% (i.e., stable, and sustainable), see Table 12.

**Table 12: Policy Choice Stability Check (PCSC) of Ontario’s HPV Policymaking Process**

<b>Policymaking Process</b>	<b>Positional Evidence</b>	<b>Situational Evidence</b>	<b>Value for money Evidence</b>	<b>Policy Choice Stability Check</b>
Sensemaking	Policy choice is: 1. Justified <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2.Redistributive <sup>11</sup> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Policy choice is: 1. Practical <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2. Interventional <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Policy choice is: 1. Cost-effective <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2. Financially sustainable <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	$\frac{7 + (5 - 1)}{1 + (6 + 6)} \times 100 = 85\%$

While sensemaking comes across as a much simpler and perhaps a faster policymaking process, it can be a costly choice because the approach can easily discount opportunities to acknowledge alternative evidenced-based facts about the policy choice(s) for better outcomes. For example, because of the quick way the policy decision was made and the nearly non-resistant stable actors in the policymaking process, it was very difficult for fringe actors with alternative policy solutions to move into the policy space given the timeline. Another issue that sensemaking presents is ambiguity and probably overconfidence in a position that may be taken by a participant(s) (Ibarra & Andrews, 1993; Holt & Cornelissen, 2014). For example, the Premier of Ontario’s announcement of the vaccination program and the confidence that the vaccine will prevent HPV and cervical cancer promoted the normalization of the vaccination program even though room could be created to understand the vaccine better as it was still new on the market and some stakeholders had raised concerns (Navaneelan, 2012; Thompson & Polzer, 2012; Wyndham-West,

<sup>11</sup> Note: This estimation is made in consideration of the fact that boys were not included as beneficiaries of the vaccine at the time of the policymaking.

2014, 2016). For example, Lippman and colleagues were very critical of how quickly the vaccine was accepted without an exhaustive scrutiny of the vaccine's safety profile (Lippman et al., 2007, 2008). Some stakeholders also discounted the quick acceptance and normalization of the vaccine, advising that the government err on the side of caution by gathering more data on the vaccine's safety prior to nationwide roll-out (MacDonald et al., 2008; Mah et al., 2011). Defiance to such a critical issue as vaccine safety and going forward with a policy choice can short-circuit the validity and reliability of the policymaking process when more facts are presented in the future that challenge the policy choice.

#### ***6.14.2 Actor influence in vaccine policymaking***

Actors influencing the vaccine program decision are varied, however, their levels of power, interest, and resource base dictate how much influence they can have in the policymaking process. The confluence of policy actors generally will be the government, society, and corporations. The intersection of these three realms does not always produce policy equity (whereby a policy address systemic disparities and increase opportunities for the disadvantaged), however, as in most cases government and corporations tend to bind tightly together in the policymaking process (Buse et al., 2012; Prithwiraj & Tarun, 2012; Moon, 2019; Zhang, 2021). This is due to their nearness to power and a financial resource base to influence decisions. While government actors must serve as referees between society and corporations, corporations' influence on government to act in its stead is much stronger as corporations are more able to support government functions through job creation, donations, and taking on philanthropic projects, which may otherwise never be undertaken (Henry & Lexchin, 2002; Bereskin & Hsu, 2016). Clearly the vaccine manufacturer, Merck, implicitly was a central player in the HPV vaccination policymaking process. Even though not conspicuous, their effects through the policymaking process were evident (Thompson & Polzer, 2012; Wyndham-West et al., 2018). For example, Wyndham-West and colleagues note

that “[w]hile there is a complex network of actors, it is clear which actors are in the centre of power” in the light of the government of Canada having “little control” in the HPV vaccination policymaking process vaccine (Wyndham-West et al., 2018, p. 14).

Understandably, the primary objective of government is to satisfy their fiduciary duties as a foremost responsibility to the population, and for the vaccine manufacturer, to its shareholders. For this reasons, as Perkins put it, “[vaccine manufacturers] must make decisions based on profit” (Perkins, 2001, p. 422). According to Ledley and colleagues, understanding this fundamental base of the pharmaceutical companies as a profit making entity is “essential to formulating evidence-based policies to reduce [medicine] costs while maintaining the industry’s ability to innovate and provide essential medicines” (Ledley et al., 2020, p. 834).

According to Wyndham-West, while Ontario set the school-based HPV vaccination program, it did not provide the public with campaign information; rather it leveraged on the “marketing campaigns” of Merck to “fill that gap” (Wyndham-West, 2016, p. 27). Merck adopted two marketing campaigns which were released prior to the approval of Gardasil<sup>®</sup> by FDA and Health Canada. The first campaign was the ‘Make Connection’, which emphasized “It’s your health, it’s your life. So take control.”; and the second campaign was ‘Tell Someone’, which also emphasized ‘spreading the word about HPV (ibid, p.32). Interestingly, Ontario’s HPV vaccination program was framed as a cervical cancer vaccine, as a way of establishing “a perception of a public health crisis” (Thompson and Polzer 2012, p. 104). This aligned with the promotional strategy of the pharmaceutical company for the vaccine.

### ***6.14.3 Cervical cancer prioritization***

Cervical cancer has been of high public health priority in Canada for decades. For example, the first national cervical cancer surveillance report “Cervical Cancer Screening in Canada: 1998 Surveillance Report” captured screening data in six provinces and reported on program

performance, screening participation, incidence, and mortality of cervical cancer (Canada, 2002, p. iii). In Canada women receive regular screening from general practitioners, gynecological specialists' offices, community health clinics, and hospitals. The Ontario government indicated that it was prioritizing HPV vaccine to women at a younger age because it wanted to prevent the spread of HPV (a causal agent for cervical cancer) and save lives. The HPV vaccine is prophylactically effective before a person is exposed to high-risk HPV that causes cervical cancer.

To hasten the HPV vaccine licensure, for example, the vaccine received priority review status because Merck claimed the vaccine would “provide effective prevention of a disease or condition for which no drug [was at the time] marketed in Canada” (Navaneelan, 2012, p. 43).

#### ***6.14.4 Vaccine purchase negotiation and introduction***

As indicated earlier, negotiations on the price of vaccines occur at the federal level with the federal government's PMPRB taking responsibility of ensuring the government is paying the right price. The HPV vaccine happened to be the most expensive vaccine at a cost of \$404 for 3-dose schedule (Lippman et al., 2007, p. 485). Since 2003, the Canadian government has supported provinces and territories in their immunization programs (Shefer et al., 2008, p. K72). This means, by introducing the 2-dose schedule, Ontario reduces its program cost overall. Thus, the province-wide HPV vaccination program in Ontario did not significantly impact the provincial health budget for the period that the federal government partly supported it.

#### ***6.14.5 Right to health***

The initial framing of HPV as a female disease directly provided an excuse to deprived boys in the same cohorts a right to health to protect themselves against HPV infection. This is because HPV is non-discriminatory and equally infect boys with potentially varied HPV related diseases. Whereas the bivalent HPV vaccine (Gardasil®) which was initially introduced, target

high risk strain (16 and 18), etiologically identified to cause cervical cancer, boys are not alienated from being infected, with the risk of penile cancer. Whereas this is the case, feminizing HPV infection as a female disease directly stand in the way of boys receiving the vaccine prophylactically in same ways as girls. While this divide received conspicuous backlash from some public and academic actors, in that it discriminated against females by normalizing HPV infection as a female disease it equally discriminated against males. This is because the strategy directly blocked school going males from having similar access to the HPV vaccines. According to the Ontario Human Rights Code enacted in 1962, discriminatory actions against people by gender/sex is prohibited as the code requires equal treatment (OHRC, n.d). The initial refusal of boys to be vaccinated can therefore be counted as a violation of their rights to health which again, is a breach of fundamental human rights. The feminization of the HPV vaccine has been seen as a point-of-sale strategy. As a corollary effect, it also gives females the leverage to make demands for health. Feminization is when a public (health) problem and its construct/problemization is centered on females (Douglas, 1998; Daley et al., 2017). In 2013, Canada extended public funds for school-based HPV vaccination program to include boys. In 2016, Ontario included boys in its HPV vaccination program (Goyette et al., 2021, p. 995). This extension provided grounds to cancel the notions of HPV vaccine feminization construct and directly expanded opportunities for more adolescents to benefit from the vaccination program. The inclusion underscores the province's universal access to healthcare devoid of discrimination by gender.

### **6.15 Conclusion**

Sensemaking, as a policymaking process, incorporates experiences of individuals and of groups to build a story whose essence accommodates the realities of the policy in question (Weick et al., 2005; Tenbenschel, 2015; Gilson, 2016). This fluidity of realities and experiences can create a complex environment where actor interest rather than social need is calibrated. The different

interests and role of governments, industry, advocacy groups, social groups, and other interest groups converging with their underlying goals can undermine optimal policy outcomes. For instance, Wyndham-West and colleagues emphasize the role of Merck and other private actors and their fluid penetration in the HPV policy arena in Canada, presented a logic to accept the “placement of private interests within the realm of public health” as a political function that structures the Canadian policy environment (Wyndham-West et al., 2018, p. 280). In the Canadian case, Connell and Hunt stress that “[t]he promotion of HPV vaccination reveals something of the de facto alliance between the pharmaceutical industry, the medical establishment, and the government” (Connell, 2010, p. 73). According to Mah and colleagues, “the HPV vaccine was framed in personal, rather than public, terms by both proponents and opponents of the vaccine” (Mah et al., 2011, p. 1853). While the HPV vaccine has been considered the most expensive vaccination program, interestingly it happens to be the one that was quickly introduced (Haas et al., 2009; Mah et al., 2011). It is worth noting that the policy infiltration of Merck lobbyist in the Canadian policy milieu is not very different from the situation in the U.S. and elsewhere in HICs. For instance, Haas and colleagues in their assessment of how seven industrialized countries (Australia, Canada, Denmark, Germany, New Zealand, Switzerland and the U.S.) subscribed to funding HPV vaccines in their immunization programs noted that the process was exceptionally quick with Merck playing a pivotal role (Haas et al., 2009, p. 2).

The quick announcement of HPV vaccination to grade eight girls in the public school system at no cost in Ontario reflected the province’s buy-in of the federal government’s proposal for nationwide HPV vaccination. This review, despite its shortcomings, shows that the HPV vaccination policymaking process in Ontario has been successful because the federal government adequately allocated resources for the provinces and territories to purchase the vaccine and

develop programs suitable to their policy and program execution needs. It is evident that the policymaking process for the vaccination rollout was shorter than usual. This evidence emphasizes that federal resource allocation was a key deciding factor in addition to the effective policy framing and normalization of HPV vaccine as a critical prophylactic against HPV infections and prevention of cervical cancer. The Ontario case has shown that when the federal government offered easy access to funds, for example, decisions on a normalized social problem occurred more quickly. While perceiving sensemaking as a most probable alternative to the traditional policymaking process wherein actors are in constant engagement to establish policy choice(s). The Ontario case show that sensemaking can unintentionally blind policymakers to alternatives and cause them to remain parochial because of policy choice normalization. The proposed policy choice stability check to estimate the sustainability of the policy decision can inform policymakers of the chances their policy will succeed or risk failing.

#### ***6.15.1 Limitations***

Several limitations to the scoping review conducted are acknowledged. For example, only three databases were searched for publications under the phrase “HPV (Human Papillomavirus) vaccination policymaking Ontario”. Considering that more databases could have been included for this review, this may have impacted the chances of increasing the number of eligible publications considered for inclusion. Another limitation is the exclusion of publications that did not focus on the Ontario HPV vaccination policymaking process but on Canada as a whole. This exclusion may have removed information or context that would have otherwise enriched the review of the Ontario HPV vaccination policymaking process. The rationale for this exclusion criteria, however, was to narrow the search and focus the review on understanding the distinct policymaking process in Ontario, rather than elsewhere in Canada. With only English language



publications searched, it is possible that publications in French (as a portion of the Canadian population speaks French) relevant to the subject may have been missed. The inability to read and write in French is a barrier to include French publications. While we acknowledge that these limitations could hamper the validity of the study outcome, we believe this review presents a case that few policy-related studies in this area were published. Among the varied consideration for future studies, we position that expanding the database search engines, including more than one province, and including English and French publications could lend scholarly value.

## 7 The Rwandan case study: Human papillomavirus (HPV) policymaking process in Rwanda-How political will and priority setting redefines health in LMIC Settings<sup>12</sup>

### 7.1 Abstract:

**Background:** Recent data from the International Agency for Research on Cancer (IARC) shows that, in 2020, the age-standardized incidence rate of cervical cancer per 100,000 women in Rwanda was 28.2 cases with an age-standardized mortality rate of 20.1%. Before 2011, the age-standardized incidence rate of cervical cancer was 34.5 cases per 100,000 women with an age-standardized mortality rate of 25.4%. The objective of this case study is to understand the HPV vaccination policymaking process in Rwanda to serve as a guide to policymakers in other low-income settings.

**Methods:** Relevant academic and grey literature, Rwandan government documents, and online newsletters were reviewed and analyzed using Kingdon's Multiple Stream Framework (MSF) and Foucault's concept of governmentality were used to understand the Rwanda policymaking process that hastened the introduction of a national HPV vaccination program in 2011.

**Findings:** Effective stakeholder engagement, health priority setting, and resource (obtained locally and through international development aid) allocation are significant policy markers for success. A stable policy environment in Rwanda presents an enabling environment for governmental policy to progress with virtually no disturbance.

**Conclusion:** The National HPV policymaking process in Rwanda occurred in a relatively cohesive and stable policy network environment. While internal resistance may be absent, peripheral stakeholder resistance can present a threat to a policy's survival. Technically adept policy manoeuvres proved effective in averting the efforts of policy adversaries.

**Keywords:** Rwanda, Policymaking process, Vaccination, HPV, Policymakers, Priority Setting

### 7.2 Introduction

Rwanda is a small landlocked country in central Africa with a population of about 12,900,000. According to the United Nations Children's Fund (UNICEF) country profile, the population of Rwanda is typically young with over 45% being under the age of 18 (UNICEF, 2021). About 39% of the population reportedly live below the poverty line and 16% live in extreme poverty (ibid). Most Rwandans live in rural agricultural settings with limited access to healthcare (Holmes, 2010; Binagwaho et al., 2014). The infamous Rwanda genocide, which led to the killing of about a million people, left the country's healthcare system in complete shambles. By the end

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of the war in 1994, and the rebuilding process of the nation in the aftermath, the government has made health a key priority towards socio-economic prosperity. While the Ministry of Health oversees all public health-related resource allocation and programs, the Rwanda Biomedical Center (RBC) serves as the Ministry's policy implementation arm. In 1995, the Ministry of Health, through the support of the World Health Organization (WHO), began a health reform program with the objective of “contribut[ing] to the well-being of the population by providing quality services that are acceptable and accessible to the majority of the population” (WHO, 2011, p. 8). Five years after the program’s initiation, Rwanda had restored and equipped most of its health infrastructure (ibid). In 1998, the country launched a national development plan (often referred to as “*vision 2020*”) that was aimed at making Rwanda a middle-income nation by 2020 (Binagwaho et al., 2014, p. 371). Twenty years down the line Rwanda has made significant improvements and inroads in its health sector. For instance, the country's total health expenditure (THE) per capita has taken an uphill trajectory; from US\$17 in 2003 to US\$34 in 2006 (Saksena et al., 2010, p. 1). In 2002, the Rwandan government allocated 8.6% of government revenue to health (Musafili et al., 2015, p. 839). By 2010, this has increased to 11.5% (ibid). A recent report shows that in 2018/19 the government allocated 200.8 billion Rwandan francs (approx. 200.8 million USD) to the health sector; an increase of 1.8% from the 2017/18 budgetary allocation of 197.4 billion Rwandan francs (approx. 197.4 million USD)(UNICEF, 2018, p. 3).

As a strategic step, in 1999, the country initiated a mutual health insurance scheme (also known as *mutuelles de santé* or *mutuelles*), which ensures every citizen had some form of health insurance (Schneider & Diop, 2004; Shimeles, 2010; Saksena et al., 2011). While several insurance schemes currently are in place to target a specific group or population, the mutual health insurance scheme has been a pillar of the country’s framework to attaining Universal Health

Coverage (Twahirwa, 2008; Makaka et al., 2012; Chemouni, 2018). It is reported the insurance scheme currently covers over “three-quarters of the population” and records the highest enrollment in health insurance in sub-Saharan Africa (Chemouni, 2018, p. 87). Rwanda's health insurance program reportedly pivoted on three levels of public policymaking ideas: 1) pragmatic ideas, 2) problem definition, and 3) policy ideas (Chemouni, 2018, p. 96). In the areas of disease prevention interventions such as vaccination, Rwanda has shown continuous dedication and commitment. For instance, Rwanda consistently reports over 95% coverage in childhood vaccination (Binagwaho et al., 2013; Cousins, 2019). The National HPV vaccination program designed for girls as part of the country’s cervical cancer prevention recorded over 90% in coverage and uptake in the first year of the program’s initiation. According to Bao and colleagues, multiple factors contributed to the success of Rwanda’s vaccination program including, “strong, high-level political will, multilevel accountability, effective use of funding, partnership with development partners, integrated health information, and community-level data collection” (Bao et al., 2018, p. 47).

Rwanda’s resilience to overcome its past genocidal history, crumbling healthcare before 1995, and economic setbacks to become the first African nation to initiate a very successful national HPV vaccination program with sterling uptake and coverage is commendable. On May 30, 2019, Sophie Cousins’s article *Why Rwanda could be the first country to wipe out cervical cancer* in CNN’s health column highlighted the government’s health prioritization towards the elimination of cervical cancer in the country (Cousins, 2019). A similar heading, *Could Rwanda Become The First Country To Eliminate Cervical Cancer?* was also captioned in another online news, *Newsroom*, on July 16, 2019 (Lewis, 2019). As the first African nation to have a nationwide HPV vaccination program, Rwanda sets a baseline for other African nations, particularly those that have yet to incorporate HPV vaccination into their national immunization program.

### 7.3 Theoretical lens

Kingdon's Multiple Stream Framework (MSF) was used to analyse the Rwanda policymaking process regarding the introduction of the national HPV vaccination program in 2011. Kingdon's MSF involves consideration of three streams (problems, policies, and politics) whereby these streams dynamically “interact to produce windows of opportunity” for action during governmental agenda setting (Béland & Howlett, 2016, p. 222). When all streams converge, a window of opportunity is created to address the policy (Kingdon & Stano, 1984; Kingdon, 1995). The focus of Kingdon's MSF is on the development of ideas for agenda setting and looking for the right moment (window of opportunity) to get the idea(s) the needed attention to trigger policy change (Kingdon & Stano, 1984; Kingdon, 1995; Mukherjee & Howlett, 2015). The propelling force for these ideas could be triggered by policy entrepreneurs who will normally invest their time and resources to advocate for a particular position, interest, or goal in return for future benefits of the policy position advocated for. According to Roberts and King, policy entrepreneurs “are public entrepreneurs who, from outside the formal positions of government, introduce, translate, and help implement new ideas into public practice (Roberts & King, 1991, p. 147). They serve as essential policy gap closers with their long recognized contribution to policy process (Polsby, 1985). Policy entrepreneurs have an overload of information on a problem, however, wait to build relationship(s) thereafter tactically relaying the problem(s) you need to solve and why you must solve a particular one first as a priority amidst other competing problems that may need equal attention. To a large extent they help to reposition a government priority on agenda setting; thus, moving as agents of politics and policy change. For these reasons, policy entrepreneurs will be at the forefront of shaping the flashpoints of the problem, advancement of remedies and options, assist in the development of political strategies, etc. – all to the end of their gains. For example, Abiola and colleagues in their assessment of the HPV vaccine policymaking

process in the U.S. assert that the role of policy entrepreneurs “seemed to make the difference between success and failure to enact a policy” (Abiola et al., 2013, p. 673). In actuality, the policy entrepreneurs bind the three streams of MSF (problems, politics, and policies) together and create the policy window which in essence projects the policymaking process lifecycle.

Policymaking happens within a policy network. Policy networks describes cluster of actors (with an interest) who are commonly interconnected together (either loosely or tightly) by resource dependences in complex networks and interact regularly to share or spread information or engage in collective action to materialize their common interest (Marin & Mayntz, 1991; Rhodes & Marsh, 1992; Peterson, 2003; Dye, 2005). Similarly, Rhodes put forward that policy networks are “sets of formal and informal institutional linkages between governmental and other actors structured around shared interests in public policymaking and implementation” (Rhodes, 2007, p. 1244). They operate at macro, meso, and micro levels either independently or dependently based on their configuration (Dredge, 2006). The collective power gained by actors in policy networks also provides them exclusivity and enables their capacity to decide what issue will need to be included or excluded from the policy agenda and ultimately bargain among themselves to materialize policies (Richardson, 2000; Dye, 2005). This is because they are able to fairly represent their interest in public policy prescription through effective persuasion of “key agents of governments through efforts such as lobbying and coalition” (Kozhikode & Li, 2012, p. 339).

#### **7.4 Methods**

The research received ethics approval from the Human Participants Review Sub-Committee, York University’s Ethics Review Board, Office of Research Ethics (ORE), which confirmed the research conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. The ethics approval certificate for this research is certificate #: STU 2021-137, and approval period

from 11/12/2021-11/12/2022. For comprehensive understanding of the policymaking case in Rwanda, multiple approaches were utilized to converge thoughts, ideas, and knowledge to enhance the quality and validity of the Rwandan case. Stakeholders were identified and contacted for interviews between November 16, 2021, to January 16, 2022. Most key informants who were initially identified declined due to other commitments, while some did not respond to the request for interviews entirely. One person agreed to participate; however, preferred the interview questions be sent over email. The interview questions were completed and emailed back. Informed consent and a copy of the ethical review for the research was also sent to the participant. The interviewee's responses were corroborated with literature and government documents delineating the policymaking case in Rwanda. Relevant Rwandan government documents, academic and grey literature, and online newsletters were reviewed and analyzed using Kingdon's MSF to understand the Rwandan policymaking process concerning the introduction of the National HPV Vaccination program in 2011.

## **7.5 Health as a human right in Rwanda**

In answering the question of how citizens in Rwanda demand the right to health from the government or have done so in the past? a senior executive (coded: R001) of the Nyamirambo Women's Center in Kigali, one of the organizations that was contacted for this research, pointed out that, "Every Rwandan is entitled to health insurance. The Government pays insurance for the poor identified by UBUDEHE (Levels according to socio-economic status)". According to the Rwandan online portal, [www.rwandapedia.rw](http://www.rwandapedia.rw), *Ubudehe* is a social welfare term that "refers to the long-standing Rwandan practice and culture of collective action and mutual support to solve problems within a community." This means health is a social good and a community responsibility in Rwanda that is collectively addressed.

Over the past decade, Rwanda has consistently incorporated health equity, value for money, quality, and a sense of human rights ideals in all of its policies (Binagwaho et al., 2012; Musafili et al., 2015). The Ministry of Health oversees all health-related issues with an overarching objective of providing “universal accessibility (in geographical and financial terms) of equitable and affordable quality health services (preventative, curative, rehabilitative and promotional services) for all Rwandans” (Rwandan Ministry of Health, 2015, p. 15). Foremost to this objective is to reduce disease burden by infectious diseases and non-communicable diseases and maternal and child health through primary healthcare (ibid). As a sovereign nation, Rwanda is a signatory to many international and regional treaties and agreements that continue to guide its health policy. Examples of these include the Abuja Declaration (1989), the African Health Strategy (2007–2015), the Paris Declaration (2005), the Accra Agenda for Action (2008), and more recently, the Rio Political Declaration on Social Determinants of Health (October 2011) (Rwandan Ministry of Health, 2015, p. 3). Rwanda has enshrined in its Constitution (Article 41) a commitment to prioritize health as a human right, stating that; “All citizens have rights and duties relating to health. The State has the duty of mobilizing the population for activities aimed at promoting good health and to assist in the implementation of these activities. All citizens have the right of equal access to public service in accordance with their competence and abilities” (ibid). To outlive this statement, especially in neutralizing the horrid remembrance of the genocide, a commitment by the government is made to “invest in life” as a form of avoiding all forms of human violence (Binagwaho et al., 2014, p. 371). In April 2011, Rwanda successfully initiated its nationwide HPV vaccination program with 93,888 (95.05% coverage) primary grade six girls receiving their 1-dose of Gardasil® at no cost to them (Binagwaho et al., 2011a, 2012, 2013; Kramer, 2021). The 2-dose and 3-dose for the same cohort recorded 89,704 (93.90% coverage) and 88,927 (93.23% coverage)



respectively (Binagwaho et al., 2012, p. 624). Between 2011 and 2018, it is reported that 1,156,863 girls received their first dose of the HPV vaccine (Sayinzoga et al., 2020, p. 4002).

In one of our interview questions on whether HPV vaccination for adolescents (for example) should be a priority for the government? R001 responded “sure because “[p]revention is better than cure”. The executive noted that the government has given adequate governmental attention/priority to cervical cancer through “[f]ree vaccinations, [a]dvocacy including our first Lady”. R001 also noted that “[n]ational & [p]rivate televisions plus [n]ewspapers” are media outlets that influence vaccination uptake in Rwanda.

Post-war Rwanda has clearly expressed a commitment and understanding of where it wants its public health capacity to be despite financial resource deficiency. The country is consistently proactive with plans to address public health issues and this has created opportunities for it to receive assistance from outside sources (Binagwaho et al., 2012; Holmes, 2010; Kramer, 2021). The Rwandan policymaking process presents a stable environment that hybridizes different elements of the policy, aligning them into perspective through the application of informed evidence to iterate existing health policies. This provides an enabling environment for health policy gains in Rwanda’s health sector (Binagwaho et al., 2014, p. 372). To understand the Rwandan policymaking process for the national HPV vaccination program, Kingdon’s MSF supports the analysis, with three streams (problem, politics, and policy) dynamically engaging to create windows of policy opportunity in agenda setting (Béland & Howlett, 2016, p. 222). The problem stream defines the scope of the public issue, the politics stream identifies the political will from the government and actors, and the policy stream describes the availability or paucity of solutions (Kramer, 2021, p. 271) whose convergence creates a window of opportunity to address the policy issue.

## **7.6 Problem stream**

In Rwanda, cervical cancer ranks as the leading cause of female cancer and death (Bruni et al., 2019). Before 2011, the age-standardized incidence rate of cervical cancer was 34.5 cases per 100,000 women with an age-standardized mortality rate of 25.4% (Binagwaho et al., 2013; Kramer, 2021). With the prevalence of cervical cancer in the country, the government placed a high priority on cervical cancer prevention and control.

## **7.7 Policy stream**

It is important to state that, as part of Merck's commitment to health in society, it has programs in place that provided access to their products for people who cannot pay and allows impoverished countries to apply for free doses of Gardasil® (Fernandez Branson, 2012, p. 149).

In April 2009, the first lady of Rwanda, Jeanette Kagame, met with Merck executives to negotiate access to Gardasil® for Rwandan women as part of the country's efforts to eliminate cervical cancer. Mrs. Kagame's efforts led to Merck sending representatives to Rwanda in April 2010 to work with the Rwandan Ministry of Health and other technical working groups to develop a plan for the deployment of a national cervical cancer strategy (Binagwaho et al., 2012). The relationship between the stakeholders was relatively stable and coherent creating a conducive policy network environment. As a result of the stable policy network environment created, within a short period of six months (October 2010), Rwanda's National Strategic Plan for the Prevention, Control, and Management of Cervical Lesions and Cancer was developed (April-October 2010) (Binagwaho et al., 2012). As part of the national strategic plan, it was agreed upon by the stakeholders that lower school-going girls (Grade-based strategy) will be targeted to receive the 3-dose schedule of Gardasil® vaccine, while women between the ages of 35 and 45 years will undergo routine screening. The rationale for this approach was based on data that about 98% of Rwandan girls attend primary school and women aged 35-45 years may have already debuted sex

in their lifetime (Binagwaho et al., 2012; UNICEF, 2021). Because most girls were in school the effective participation and buy-in of the Ministry of Education were crucial to the success of the program, as the schools will present a large coverage point. For program effectiveness, the working group specifically targeted girls in primary grade six and the expectation was that the majority of them may not have debuted sex (Binagwaho et al., 2012, p. 625). For girls who were not in school, a community-based strategy was used to reach them (Binagwaho et al., 2012; Brandt et al., 2016). Since the vaccination was voluntary, to increase participation and buy-ins from guardians, community leaders, advocacy groups, and media were actively involved to ensure the public was well informed.

One of the key negotiators for Merck, former chief public health and science officer, Mark Feinberg, noted that in the early stages of the HPV vaccine, many countries, especially in HICs that debated on HPV vaccination policy were conflicted on where the focus should be. Whether to focus on the transmission of the disease or “on the fact that HPV leads to cancer and this vaccine will prevent cancer” (Cousins, 2019). Rwanda in its planning stage on what to do first chooses to focus on one thing: emphasized cancer prevention (ibid). According to the Minister of Health at the time, Agnes Binagwaho, “the Ministry of Health considered the overwhelmingly positive evidence of the effectiveness of the HPV vaccine to be a call to action” (Binagwaho et al., 2012, p. 623). On the question of who has the power to influence HPV vaccination, R001 indicated that policymakers and negotiation for “international support” are drivers that influence HPV vaccination in Rwanda.

## **7.8 Politics stream**

It is important to mention that the Rwandan Minister of Health in 2011, Agnes Binagwaho, and Merck had a prior relationship as board members of Gavi. Despite the stable policy environment enjoyed in the Rwandan HPV vaccination policymaking process, peripheral

stakeholder resistance was not absent from the process. Typical of this is Nobila Ouedraogo and colleagues who, in July of 2011, wrote a correspondence letter to the Lancet editor to express their dissatisfaction with the Rwandan HPV vaccination program. Ouedraogo and colleagues indicated they have “serious doubts that this arrangement [referring to the Rwanda and Merck arrangement] is not in the best interest of the people” (Ouedraogo et al., 2011, p. 315). The authors criticized the government for being secretive about the cost of the vaccine, choosing to eliminate cervical cancer when other vaccine-preventable diseases such as tetanus and measles needed prioritization, raised concern about the uncertainty around the effectiveness of HPV vaccines, and finally claimed issues of conflict of interest (Ouedraogo et al., 2011, pp. 315–316). The Rwandan Minister of Health and her colleagues responded to the argument put forward by Ouedraogo and colleagues in a correspondence to the Lancet editor (see table 13).

**Table 13: Peripheral stakeholder resistance and policy network maneuverability**

Argument <sup>13</sup>	Counterargument <sup>14</sup>
We have serious doubts that this arrangement [Merck providing HPV vaccines to Rwanda] is in the best interest of the people.	Are the 330 000 Rwandan girls who will be vaccinated against a highly prevalent, oncogenic virus for free during the first phase of this programme not regarded as “the people”?
[A]lthough the burden of cervical cancer in low-income and middle-income countries is substantial (3·8 million disability-adjusted life-years [DALYs]), it ranks well behind that of other vaccine-preventable diseases such as tetanus (8·3 million DALYs) and measles (23 million DALYs).	[F]or the diseases cited (measles and tetanus), Rwanda has 95% and 96·8% vaccination coverage rates, respectively.
[T]he effectiveness of the HPV vaccine against cervical cancer is still unknown.	Many studies say otherwise.
[T]o remain cost-effective in GAVI-eligible countries, the costs for a vaccinated individual should not exceed US\$10 for the three doses.	[The initial price of the pneumococcal vaccine provides a helpful lesson, and Merck announced a two-thirds reduction in the price of Gardasil for GAVI-eligible countries (to US\$5 per dose).
Representatives of vaccine manufacturers and the Rwandan Minister of Health are on the GAVI Board—an obvious conflict of interest.	Merck representatives are non-voting GAVI observers, and GAVI's website clearly shows Rwanda's board membership terminating on Dec 31, 2011. GAVI will have no role in the HPV vaccine program before 2014.

<sup>13</sup> Ouedraogo, N., Müller, O., Jahn, A., & Gerhardus, A. (2011). Human papillomavirus vaccination in Africa. *The Lancet*, 378(9788), 315–316

<sup>14</sup> Binagwaho, A., Wagner, C. M., & Nutt, C. T. (2011). HPV vaccine in Rwanda: Different disease, same double standard. *The Lancet*, 378(9807), 1916.

Binagwaho and colleagues in conclusion remarked that Ouedraogo and colleagues have “nihilistic claims against [the] provision of antiretroviral therapy in Africa”, one “that constitutes but the latest backlash against progressive health policies by African countries”(Binagwaho et al., 2011, p. 1916). External adversaries did not resurface after Binagwaho and colleagues’ response, thus, allowing the policymaking process to maintain the stable policy network that was formed to formulate and implement the program.

### **7.9 Policy entrepreneurs**

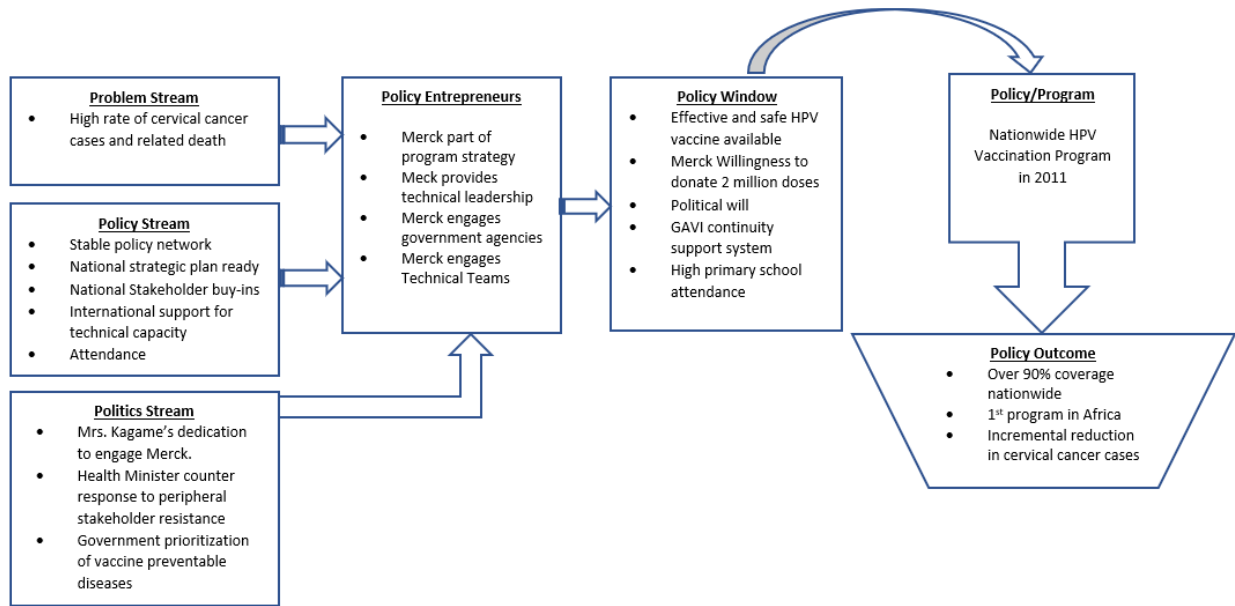
In the case of the HPV vaccination program in Rwanda, many external interest groups such as Merck, Qiagen, Gavi, the US Centers for Disease Control and Prevention (CDC), and the International Center for AIDS Care and Treatment Programs (ICAP) at Columbia University as well as Mrs. Jeannette Kagame played various important roles. Considering that Rwanda did not have the financial resources to fund the program on its own, Merck’s role in instrumentalizing the project with technical strategies, program development, and most importantly donating 2-million doses of Gardasil® provided the enabling conditions. By understanding the role of Merck in other jurisdictions, such as the U.S. and Canada, where the HPV vaccination policymaking process has seen Merck playing roles as program advisers or strategist is instructive in the Rwandan case (See figure 6 for the schematic flowchart expressing the HPV vaccination policymaking process in Rwanda).

### **7.10 Policy window**

The arrangement between the government of Rwanda and Merck led to Merck donating 2-million doses of Gardasil® HPV vaccine free of charge to be administered to school-going adolescent girls for three years. Other arrangements made by the Rwandan government engaged Qiagen and Gavi to ensure the flow and continuity of Rwanda’s effort to eliminate cervical cancer in the country. After the three-year arrangement with Merck was over, Merck charged for the

supply of the vaccines, however, this payment was covered by Gavi as part of the arrangement. Qiagen, on the other hand, provided 250,000 HPV tests for women aged 35-45 in Rwanda as part of the cervical cancer prevention program. These arrangements constitute what Binagwaho and colleagues have referred to as a “public-private community partnership” [designed] for effective programme implementation [that is] specific to the Rwandan context (Binagwaho et al., 2012, p. 624). Besides the support Rwanda received, the government in 2011 also dedicated 22.1% of the country’s budget (about 11.0% of gross domestic product) to the health sector (Binagwaho et al., 2014, p. 372). As noted by Binagwaho, “[w]e don’t have all the capacity to be there [i.e., where Rwanda wants to be] now. But when we have an opportunity like Gavi, we really know where to put it immediately to make the difference, because we have that plan” (Holmes, 2010, p. 945). According to Holmes, Rwanda’s attitude to foreign aid for health is a key indicator for success. This is because the country “fully integrated [aid] into the health system, and is only used if it addresses a need already identified by the Ministry of Health” (Holmes, 2010, p. 945). With these sustainable stakeholders and program arrangements cordially harnessed, Rwanda’s cervical cancer prevention was set into motion.

**Figure 6: Schematic flowchart of Kingdon's MSF framework used to understand the HPV vaccination policymaking process in Rwanda**



Source: author developed, 2023

## 7.11 Discussion

### 7.11.1 Policy network stability

Kingdon's MSF promotes the convergence of public problem, politics around the public problem, and the suggested policy (idea/intervention) to the public problem. When all three streams converge, a window of opportunity is created for policymakers to act. The action by policymakers to take advantage of the window of opportunity is dependent on the stability of policy network. The stability of a policy network to a large extent determines whether a suggested public policy or intervention will be made or not. When the policy network is stable, an equilibrium is reached where stakeholders are willing to minimize or compromise on some or totally renege their inherent interest for the collective good of the network. A common observation in Rwanda's vaccine policymaking process is the stability of the policy network. HPV policy and programs received sufficiently least resistance in post-war Rwanda, unlike that seen in other democratic jurisdictions. This stability, besides many other factors, is cautiously assumed to be

produced by two factors: 1) the scar of the genocide and the caution not to return to the horror of the past, and 2) a national commitment to rebuild a broken country in unity rather than in disunity. Whether either of these two factors hold or not, begs a question of where the freedom of other interest groups can be situated when they may have alternatives to a policy problem. To answer this will require a much lengthier analysis that is beyond the scope of this paper. However, I will attempt to provide some treatment to this.

Rwanda has three ethnic groups: the Hutu (85%), Tutsi (14%), and Twa (1%). Whereas the Hutus are the majority, political power has predominantly been controlled by the Tutsis (Chemouni, 2018, p. 89). Before the war in 1994, political power was vertically vested in the Rwandan Patriotic Front (RPF) party. The RPF government is centrally dominated by minority Tutsi who also own major enterprises and businesses in the country. The power imbalance and socioeconomic inequity at the time were flashpoints to the war in 1994. In post-war Rwanda, these problems were said to be addressed in an inclusive government approach through thoughtful power distribution, decentralization, and ownership of government-led programs. With these structures, governments will technically expect little to no resistance. For example, Chemouni points out that there is virtually no political opposition to government policies, thus preventing the “emergence of alternative political ideas and projects” (Chemouni, 2018, p. 89). Two suggestions for this positioning have been put forward: 1) that the constitution of the country limits an incumbent political party to have more than 50% of ministerial portfolios, and 2) political spaces are closed, and limits on media and civil society activities are normalized (Gready, 2010; Gökçür, 2012; Reyntjens, 2013; Chemouni, 2018).



### ***7.11.2 Governance system in Rwanda and its effect on health policymaking***

The near absence of opposition voices in the Rwandan political and policymaking process has been questioned by some. For example, some have accused the president, Paul Kagame (current leader of the RFP) of running a one-party state and employing a soft authoritarian regime where opposition to social policies and programs is not tolerated (Hagmann & Reyntjens, 2016; Chemouni, 2018; Desrosiers, 2020; Bisoka & Geens, 2021). To understand this criticism, we need to understand the rationalization of the actions of the government. Michel Foucault, in his treatment of the subject “governmentality” (from the two words, ‘government’ and ‘rationality’ together), describes this as the process whereby governments exercise rational and carefully thought through programs meant to be undertaken by diverse agencies and entities with the liberty to employ techniques and other forms of knowledge deemed expedient for the societal good (Larsson, 2020, p. 8). In this view of governmentality, citizens are perceived as willing participants to be governed by the elite and legitimizes this participation through constituted norms. By norms reference is made to the implicit nonformal ideas and social behavior that is “constructed, understood, and disseminated among groups through communication” without resistance (Rimal & Real, 2003). The process of accepting government decisions without opposition expresses layers of power dynamics that function through the lenses of different political technologies. Such acquiescence has been referred to as biopower by Michel Foucault. This form of power functions within the realm of biopolitical management (Foucault, 1991; Nica, 2017). By biopower, Foucault points to governments exercising “power that exerts a positive influence on life, that endeavours to administer, optimize, and multiply it, subjecting it to precise controls and comprehensive regulations” (Foucault, 1976, 1990). He refers to biopolitics as the political rationality which put into consideration the governing of life and population as its subject to ensure that life is sustained and can multiply (ibid). Deductively, biopower can be stretched in the interest of ruling

government/authority to maintain stable governing of the people. In Rwanda, it can be abstracted that biopower and biopolitics symbiotically are at the foreplay of government strategy of achieving policy and program goals. This can be deduced from ideals such as *Ubudehe* and *Imihigo*, which are self-managed strategies.

Further assessing the posture of network stability pushes to the fore the development aid Rwanda receives. In his writing *Aid and Authoritarian Africa*, Bird asserts that, in Africa, aid can become a tool to accentuate power in different forms. For example, Bird points out that while the Kagame government is lauded on different fronts of development areas, such as health and education, “opposition voices and dissent are regularly suppressed” (Bird, 2017, p. 84). Kagame, a former warlord, has been likened to the Italian diplomat and politician, Nicolo Machiavelli, and his political ideals prescribed in his famous book *The Prince* (Reese, 2014; Agbaenyi & Anekwe, 2019; Hintjens & Asiimwe, 2019). According to Reese, Kagame’s political leadership style “inspires love, fear, and a unique paternalism” among Rwandans (Reese, 2014, p. 107). It is this Machiavellian style of leadership employed by Kagame that has led the country to its blooming success and special attention in Africa (ibid). Russell similarly has called Kagame’s leadership the “benevolent dictatorship” that offsets negative government outlook for positive outcomes, such as security and stability for its citizens (Russell, 2012, p. 12). It is noted that the leadership model for an individual with military background stepping into a democratic space hinges on “two attitudinal changes – democratized decision-making and adapted political goals” (Waldorf, 2017, p. 69). Waldorf posit that while the Kagame government adapted to its political goals of rebuilding the nation as a means of appeasing political opponents, its model for decision making was not democratic. This undemocratization of decision making at once becomes a tool and technique that beguiles fear on one end and obeisance on the other, thus, maintaining a powerful tool that can

implicitly or explicitly quieten policy and political adversaries, “re-educate the populations, deliver public goods, and attract donors and investors” (Waldorf, 2017, p. 87). Presumably, policy network stability in the Rwandan policymaking processes presents a distinct view of political power and dominance, bold leadership style, and a culture of political policy acceptance rather than policy engagement. While this presumptively may be the case, it nevertheless expresses nuances that drive policy success and also wades off policy failure from the onset. This protectionist style of policymaking wherein policy can be perceived as thrust-upon can build barriers to policy alternatives. This is because the process blocks useful ideas that may never be shared because of the stable policy network environment created due to the protectiveness of the policy network (Russell, 2012; C. Bird, 2017).

### **7.11.3 Local policy frameworks-Imihigo**

Rwanda has a track record of achieving very high (over 90%) childhood vaccination coverage in children under 5 years for diseases such as diphtheria, Haemophilus influenza type B, hepatitis B, pertussis, measles, polio, tetanus, and tuberculosis (Holmes, 2010; Kramer, 2021). This success has positioned Rwanda to be attractive to donor agencies, like Gavi. According to Bao and colleagues, post-war Rwanda has consistently leveraged on “strong relationships with development partners and cross-over effects from global health initiatives, particularly in developing capacity for supply chain and cold chain management” when it comes to vaccination programs (Bao et al., 2018, p. 47). Agnes Binagwaho remarked in an interview with *The Lancet* that when it comes to vaccination support from international development organizations is a big gain (Holmes, 2010). This is transparently organized and integrated into general support received, coupled with what the country is "doing with its resources" (Holmes, 2010, p. 945). One of these resources has been *Imihigo*. Imihigo means "*pledges*", and is a performance evaluation framework that decentralizes responsibilities of government-initiated projects and holds local and central

leaders at all levels responsible for ensuring predefined project targets are met, and also promote accountability and ownership of same (Bao et al., 2018; Kramer, 2021). Imihigo has been instrumental in Rwanda's universal childhood vaccination coverage. The high coverage reported for Rwanda's universal childhood vaccination is indicative that Imihigo was going to be an important tool to ensuring and assuring that the HPV vaccination program was successful. Markers like Imihigo put Rwanda in a good light thus making it much easier to ask for support where it is needed. It is in this light that Merck positions its interest (either financial or social) to become an active player as a policy entrepreneur in the Rwanda HPV vaccination program. Mrs. Kagame's role in advocating for cervical cancer elimination in Rwanda and her engagement with Merck and other stakeholders for support is consistent with the country's outlook on aid and capacity building to improve health.

#### ***7.11.4 Role of private partners as policy entrepreneurs***

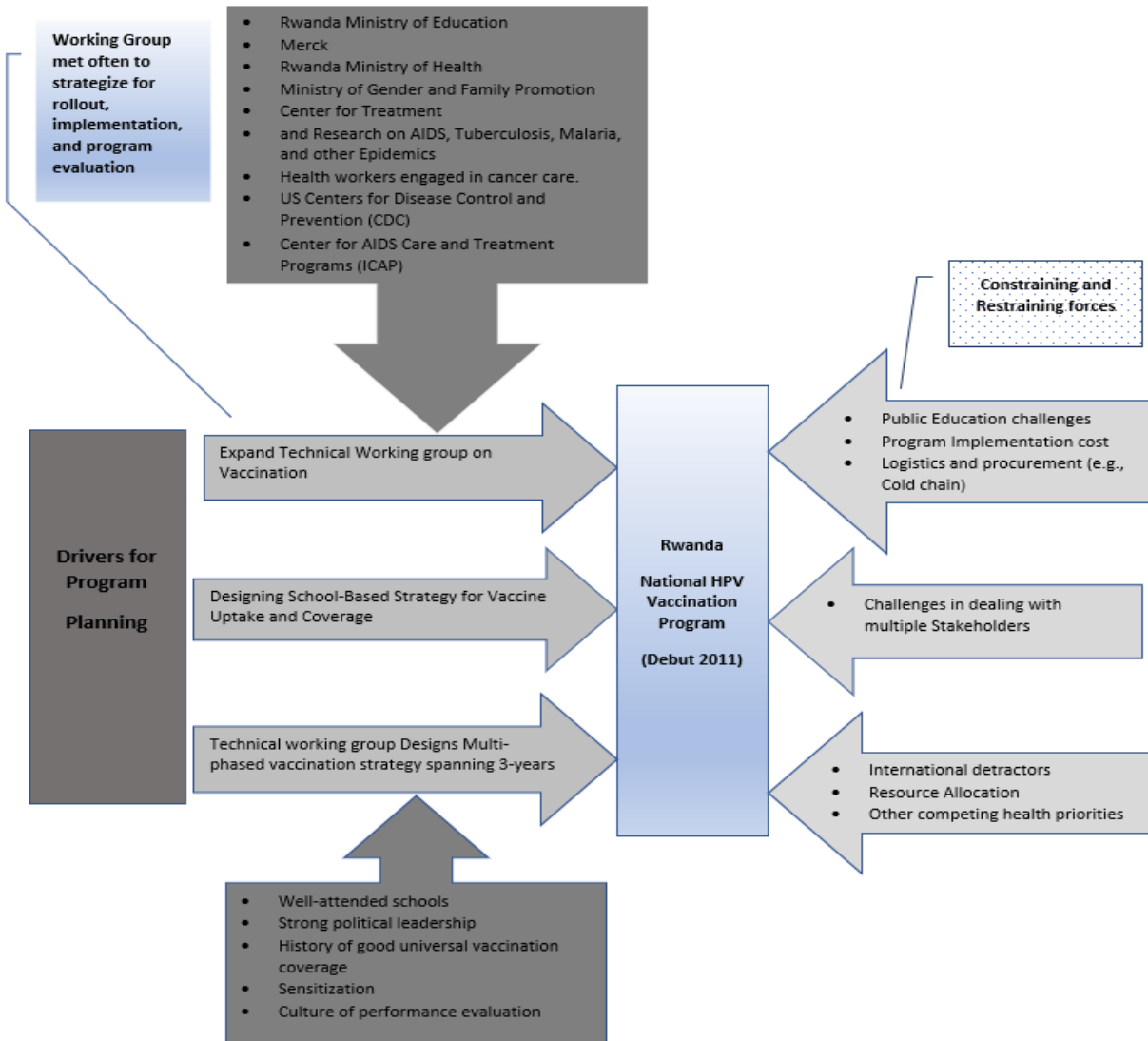
In an analysis of the politics of the HPV vaccination policymaking process in the United States, for example, Abiola and colleagues note that "effective policy entrepreneurship played a critical role in determining policy outcomes" (Abiola et al., 2013, p. 645). The authors note that while Merck was a dominant player in the U.S. HPV policymaking process, the vaccine manufacturer received backlash for inappropriate financial inducement and political clumsiness with legislators to propagate policy options for nationwide HPV vaccination (Abiola et al., 2013, p. 658). Mello and colleagues equally note that Merck received similar backlash from the public and politicians alike when it was reported that the vaccine manufacturer "was heavily involved in promoting school-entry mandates" for HPV vaccination (Mello et al., 2012, p. 893). The authors pointed out that during a congressional hearing, Congresswoman Michele Bachmann accused Texas Governor Rick Perry of conflict of interest and misconducting himself for ordering girls entering primary grade 6 to receive HPV vaccination because of his financial and political

relationship with Merck (Mello et al., 2012). It is very likely the occurrences in the U.S. policymaking process triggered Ouedraogo and colleagues to doubt the arrangements between Merck and Rwanda; most particularly on the issue of the Minister of Health, and Merck having a prior relationship as board members of Gavi. In the case of Rwanda, the aptly effective response from Binagwaho and colleagues was enough to silence the emergence of future adversaries of the Rwandan HPV vaccination program. This was an important landmark in the HPV vaccination program in Rwanda as the country was pioneering the program in Africa and any potential mishap could hamper the future of other African countries replicating it.

The role of Merck cannot be overestimated in the history of Rwanda's HPV vaccination program, as this relationship defined how the state and private sector can create shared value through the utility of resource mobilization. The arrangement between Rwanda and Merck meant Merck had to discount its profit for future return by donating 2 million doses of vaccine. Rwanda in the private-public partnership agreement expected to have Gavi assume the payment arrangement with Merck as a continuity package for program progression. With this arrangement, Merck will eventually offset the lost margins on the 2 million doses donated while enjoying a long financial return from the program's lifespan. Ruckert and Labonté have noted that partnership between the private and public sectors includes "neoliberal management of individuals and populations, allowing private interests to become embedded within the public sphere and to influence global and national health policy making" (Ruckert & Labonté, 2014, p. 1599). The authors cited the RotaTeq Nicaragua Partnership, a partnership between the Nicaraguan Ministry of Health and Merck, local hospitals, and a Technical Advisory Group to successfully implement a rotavirus vaccination campaign in Nicaragua (Ruckert & Labonté, 2014, p. 1602). Merck's experience in the private-public partnership in vaccine program development was another crucial

success factor in Rwanda’s HPV vaccination roll-out. See figure 7 for a schematic representation of the policy driving forces of the HPV vaccination program in Rwanda.

**Figure 7: Drivers of the Rwanda Nationwide HPV vaccination program development and deployment**



Source: author developed, 2023

Kingdon’s multiple streams model recognizes the important role of policy entrepreneurs and the task of coupling all the three streams of the model to create a policy window of opportunity. The model provides a panoptic lens to look at the public problem and how

policymakers prioritize and mobilize resources within the window of opportunity to solve public problems. While the public problem of HPV-related cervical cancer is a global health issue that is neglected in many LMICs, problematizing and prioritizing such a neglected issue creates opportunities for a new policy network that will set the pace for intervention through policy development and planning. While policy adversaries, either internal or external, can create political scenes, effective depoliticization and politics of compartmentalization of the public problem can silence adversaries and provide pathways for the problem stream, policy stream, and politics stream to converge and create the window of opportunity for intervention. The actions by policymakers to take advantage of the policy window of opportunity are dependent on the stability of the policy network. This stability of the policy network, to a large extent, determines whether a suggested public policy or intervention will be launched or not. When the policy network is stable, an equilibrium is reached wherein stakeholders are willing to minimize, compromise on, or totally renege their inherent interests for the collective good of the network. Rwanda presents a useful case study to illustrate the effectiveness of how Kingdon's multiple streams model helps to understand governmental priority setting and the policymaking process. The Rwandan HPV vaccination program enjoyed political pragmatism, effective stakeholder collaboration, and positive engagement with private partners and aid organizations. According to Binagwaho and colleagues, the success of the program was driven by three crucial decisions: 1) the Ministry of Health widening its technical working group to include all relevant stakeholders within and outside of Rwanda (e.g., Merck, Ministry of Education, Gavi, CDC, etc.) who would be critical to the success of the program by providing financial, technical, and/or sustainability capacity, 2) conscious decision to partner with the Ministry of Education to design a school-based vaccine uptake strategy, and 3) Technical working group deciding to subscribe to a multi-phased

vaccination strategy that spanned three years (Binagwaho et al., 2012, p. 624). The Rwandan HPV vaccination policymaking process demonstrates that governments can reach their public health goals when they have a clear plan that allows participation of the private sector. While this can be contentious, a well-managed private-public partnership creates symbiotic value streams that can be leveraged by all stakeholders for their long-term interests. Paul Kagame, described as a “modern day Machiavellian Prince”, wherein his Machiavellian sensibilities (as Reese put it) enable him to navigate a precarious political landscape (Reese, 2014, pp. 107–111); from a past warlord to a democratic president (Waldorf, 2017, p. 68). While some express the views of absolute libertarianism, this can create a series of roadblocks along the policy pathways and hinder governments from moving swiftly and quickly. While authoritarianism has been criticized for several sociopolitical problems, such as human rights abuse, soft (a.k.a. noble) authoritarian governance, which builds rather than oppresses, has proved successful elsewhere. For example, the first Singaporean Prime Minister, Lee Kuan Yew, who resolutely transformed Singapore with his noble authoritarian leadership (Reese, 2014, p. 108). While Kagame is seen as a leader with resolve, his government continues to receive criticism for human rights abuse. We cannot discount human rights abuses in authoritarian leadership, as they either implicitly or explicitly infringe on the rights of some people. Nevertheless, we argue that the success of Rwanda’s community pledge, *Imihigo*, was because people are held responsible for government-initiated programs such as vaccination. This is not common in many LMICs. It points out that the Kagame leadership style has an influence over the behavior of the people and at once becomes a policy instrument that shapes the country’s policymaking process. It is estimated from this study that political will on the part of the Rwandan government has been a foundational block to health policy outcome(s). Even though some critics have put forward the argument that President Paul Kagame’s government is



not tolerant of policy resisters, the leadership of Kagame has, nevertheless, mastered the art of assembling the political tools and policymaking elements, practices, and thinking of policymakers to effectively solve public health problems, such as vaccine preventable diseases. As is expected, the so-called authoritarian leadership style of Kagame is a frowned upon post-colonial leadership approach in many African nations that directly reduces the gains of the many policies the government spearheads (Golooba-Mutebi, 2013; Twagiramungu, 2016; Uwizeyimana, 2016; Heussen-Montgomery & Jordans, 2020; Oculi, 2021). This is because authoritarianism (soft/hard) instils some fear and can impinge on fundamental human rights. While Rwanda has shown that knowing what is available to you (for free/fee), and how to ask for help where it is needed most creates the differentiating factors that lead to policy success, it is important to mention that government leadership style remains an important policymaking instrument that determines whether a policy will become successful or not. The Rwanda nationwide HPV vaccination program is a unique case in Africa and replicating it in other LMICs that do not have similar policymaking scenarios, such as leadership style of the Rwandan president, communal program/policy responsibility (e.g., *Imihigo*), and the skills to effectively use aid, will be difficult. It is not, however, impossible. While Rwanda presents several policy levers for learning, LMICs attempting to implement a nationwide HPV vaccination program should concentrate on their own uniqueness in policy pragmatism (providing a more suitable framework), strategic program development and plans for resource mobilization, and finally, design a policy evaluation tool that serves to measure markers of success to track their progress.

## 8 The Ghana case study: Imperatives for nationwide HPV vaccination program for cervical cancer prevention<sup>15, 16</sup>

### 8.1 Abstract

**Background:** Cervical cancer is most women's nightmare and currently ranks as the second most prevalent cancer among women between the ages of 15 to 44 years in Ghana with about 8.6 million women in this cohort at risk of cervical cancer. While this is the case, cervical cancer is least prioritized by the government.

**Method:** Interviews and an online survey were conducted for analysis. SPSS and NVivo were used to organize and analyze data from 215 online survey respondents and 8 identified interviewees. Data from the literature were also used to support the data collection and analysis.

**Findings:** Only a small number of the study population debuted sex before 17 years. It is further shown that HPV awareness, knowledge of HPV vaccine, and HPV related cervical cancer are rising in Ghana, however, governmental priority setting, and resource allocation for cervical cancer prevention continue to remain low.

**Conclusion:** Currently, Ghana has no plans of introducing a nationwide HPV vaccination programme, reflecting a clear absence of political will to act and a lack of policy accountability to foster the public good. Ghana formed policy on cervical cancer prevention; however, implementation is constrained by poor resource allocation and its low placement in government priority setting. The low rate of adolescent sexual debut before 17 years presents a window of opportunity for the government to act by implementing a nationwide HPV vaccination now.

**Keywords:** Ghana, policymaking, vaccination, awareness, HPV, priority setting, resource allocation

### 8.2 Introduction

“[W]e have all the good policies, like the cancer control policy in 2010, excellent policy! The problem is implementing it. And it has always been put on the lack of funds. So, I wouldn't say we lack the policies. For the policies we have about the best you can think about. We have a very good cancer control policy for over a decade, but they've not been implemented. We know who to screen, we know who to vaccinate. They are all in the policy, but it has never been implemented because we blame it on the lack of funds. So, I wouldn't say that we don't have the capacity to make the policy. The problem is the implementation; that has been a problem”<sup>17</sup>

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<sup>15</sup> Presented chapter at the Dahdaleh Institute for Global Health Research (DIGHR) 3rd Annual Global Health Graduate Scholars Symposium, on December 14, 2022, in Toronto.

<sup>16</sup> Presented chapter as a Poster (#177) at the 35<sup>th</sup> International Papillomavirus Conference (IPVC 2023) on April 17-21, 2023, in Washington D.C., USA.

<sup>17</sup> A response from GH-001-PHY, one of the forerunners of cervical cancer prevention and control in Ghana.

As a LMIC, the economy of Ghana faces healthcare challenges that indirectly slows its socioeconomic growth. While this is not isolated for a LMIC, cancer, trauma, and some infectious diseases continue to overwhelm women in Ghana (Reichenbach, 2002; Drislane et al., 2014; Nartey et al., 2017; Adatara et al., 2018). Non-communicable diseases (NCDs), such as cervical cancer and breast cancer, have been the two foremost cancers that affect women for decades in Ghana; however, government commitment has been concentrated on breast cancer, leaving behind cervical cancer (Reichenbach, 2002). The Ministry of Health (MOH) produced a document, *Reproductive Health Service Policy and Standards*, which mentions prevention and management of cervical cancer at the district levels about two decades ago (Reichenbach, 2002, p. 51). This did not garner any policy focus to draw government attention at the time. In the early 2000s, the MOH, under the auspices of a National Cancer Steering Committee, put together the National Strategy for Cancer Control in 2012-2016. The report earmarked strategies to prevent and control cervical cancer in the country (see box 2) (MOH, 2011, pp. 17–22).

**Box 2: National strategy for cervical cancer control in Ghana 2012-2016<sup>18</sup>**

<b>STRATEGY</b>
<ul style="list-style-type: none"> <li>• Routine vaccination with one approved HPV vaccine would be offered for all females from 10 to 14 years of age.</li> <li>• Routine immunisation of pre-adolescent females shall be done as part of the national immunisation programme and funded by the healthcare system. The approach to delivery of the HPV vaccine will be a combination of school-based vaccine delivery to reach girls in school and community based and outreach clinics to reach target girls who may not be in school.</li> <li>• Catch up immunisations will be provided for girls aged 15 -18 years.</li> <li>• Community-based immunisation will be provided routinely through the existing Expanded Program for Immunisation (EPI)</li> <li>• A cervical cancer awareness program would be in place by using health communication messages via posters, leaflets, and electronic media.</li> <li>• Both organized screening and opportunistic screening would be employed to reach the target populations.</li> <li>• Screening would be integrated into the existing health system such as the reproductive health programmes (Family planning and STI services).</li> </ul>

<sup>18</sup> National strategy for cervical cancer control in Ghana 2012-2016, Ministry of Health, pp.17-20, accessed on 12 July,2022 at <https://www.iccp-portal.org/system/files/plans/Cancer%20Plan%20Ghana%20Ministry%20of%20Health.pdf>

In a similar report by the MOH, *Strategy for the Management, Prevention and Control of Chronic Non-Communicable Diseases in Ghana 2012-2016*, it was noted that women will be “opportunistically screened for breast and cervical cancer” as detailed in the *National Cancer Strategic Plan 2012-2016* (MOH, 2012, p. 30). In the report, the MOH pointed out consideration for introducing HPV vaccines into the national immunization program on two conditions: 1) when results of on-going multi-country trials (Ghana being one of the sites) become available and, 2) when the price of the vaccine drops substantially from the current level of about US\$120 per dose (MOH, 2012, p. 29).

Cervical cancer currently ranks as the second most prevalent cancer among women between the ages of 15 to 44 years in Ghana (Bruni et al., 2021, p. 9). However, cervical cancer is least prioritized by government for intervention (Binka et al., 2017; Nartey et al., 2017). According to a report by the International Agency for Research on Cancer (IARC), 8.57 million women from the ages of 15 years and above are at risk of cervical cancer in Ghana (IARC, 2018, p. 1). In 2020, it was estimated that about 2,797 cervical cancer cases were reported in Ghana, with estimated annual reported deaths sitting at 1,699, crude mortality rate of 11.1%, and age-standardized mortality rate sitting at 17.8% (Bruni et al., 2021, pp. 15–16). According to Cudjoe, this is “grossly underestimation”, because Ghana does not have a reportable national cancer registry, and only a small cohort is sampled for cervical cancer studies (Cudjoe, 2020). The 2021 fact sheet on HPV and related cancer in Ghana shows that an estimated 9,440,000 women aged from 15 and up are at risk of developing cervical cancer (ICO/IARC, 2021). This is up by 870,000 between the data reported from 2018 to 2021, which is consistent with evidence in the literature showing that cervical cancer cases in Ghana are on the rise (Binka et al., 2017; Nartey et al., 2017; Awua & Doe, 2018; Awua et al., 2020). According to the report, at any given time, 4.3% of women in the

general population are estimated to harbour high-risk HPV 16 and/or 18 strains (identified as the key causative agent for cervical cancer) (ICO/IARC, 2021). While this is the case, it has been reported that citizens' knowledge about HPV, HPV related-cervical cancer, and/or HPV vaccination is low. For example, in a recent cross-sectional study of 285 adolescent in Ghana conducted by Asare and colleagues, it was shown that about 91.2% of the participants have not heard of HPV and 95.4% have not heard of HPV vaccination (Asare et al., 2020, p. 1). Previous studies reported similar findings, thus indicating low public education on cervical cancer and its prevention and/or control (Ziba et al., 2015; Binka et al., 2017; Williams et al., 2018). While Ghana has a blanket policy for cancer (i.e., the National Reproductive Health Policy), it does not yet have a specific policy governing the prevention and control of cervical cancer. Reichenbach noted that cervical cancer falls off governmental policy priority because of the "social construction" of the disease as sexually transmitted (Reichenbach, 2002). A connotation that does not inspire strong policy advocacy as this is seen as a disease associated with sexually risky behavior. Such assertion of cervical cancer renders policy, such as the National Strategy for Cervical Cancer Control in Ghana 2012-2016, difficult to get the governmental attention and the resources needed for implementation. Priority setting, noted Reichenbach, has both health and equity ramifications, which can lead to inequitable allocation of resources (Reichenbach, 2002, pp. 56–57). The reported high incidence of cervical cancer in Ghana, inadequate public knowledge about the disease associated with HPV infection and available vaccination, and low governmental priority setting to deal with the disease despite Ghana's eligibility to receive assistance for HPV vaccine purchasing/vaccination program through Gavi provides a compelling case for this study. Currently, Ghana has not introduced an HPV vaccination programme for females, and according

to the IARC HPV Information Center fact sheet 2021 for Ghana, there are “no plans” to introduce it (ICO/IARC, 2021).

### **8.3 The Gavi factor**

Gavi provided opportunities for countries to apply for funding for HPV vaccines in November 2011. The conditions for countries to meet prior to receiving assistance from Gavi to design national HPV vaccination programs are that they must have: i) at least US \$1580 in Gross National Income per capita and ii) achieved at least 70% coverage for Diphtheria-Tetanus-Pertussis third dose (DTP3) and similar vaccines, while demonstrating the capacity to deliver multiple dose vaccines to children from the ages of 9-13 years at 50% coverage (Hanson et al., 2015, p. 409). Once Gavi has earmarked a country for assistance, support is initially provided to gain implementation knowledge by conducting demonstration vaccination. Besides the support to purchase the vaccine, Gavi also provides substantial funding to offset about 80% operational cost of the vaccine introduction. The use of this money is at the discretion of the countries, and they are also at liberty to pursue a national vaccination program or not (Hanson et al., 2015). The demonstration offers an opportunity to streamline challenges prior to proceeding to national vaccination by leveraging the knowledge gained during the demonstration stage. This is usually for a period of two years at most, if the first-year demonstration did not provide enough evidence that replication at the national level will be successful. While the market price for the HPV vaccine is around \$100, through Gavi’s assistance, with support from the WHO, vaccine manufacturer (Merck), the World Bank and the Bill and Melinda Gates Foundation, (BMGF), the HPV vaccine is made available to LMICs at a price of \$4.50 per dose (Shinkafi-Bagudu, 2020, p. 1746). Whereas this is a significant reduction in price, it could stretch the healthcare expenditure for some LMIC countries, thus, potentially making the decision to purchase a challenging one for resource-constrained nations.

In 2013, Ghana began a 3-dose HPV vaccine demonstration project sponsored by Gavi in four selected districts: Ningo-Prampram, Shai-Osudoku, Tamale Metro, and Sangregu. The project was targeted at primary school girls presumed to be around 9 to 11 years old. The outcome of the vaccination demonstration in the four districts has not been made known to the public up until the time of undertaking this study. As noted by Cudjoe, there are no published progress reports on the vaccination, the number of girls who were vaccinated, or the lessons learned during the demonstration (Cudjoe, 2020). In a recent cost-effectiveness analysis of nationwide HPV vaccination program in Ghana, the authors concluded that it is more cost effective to introduce the vaccination program than not take any action (Vodicka et al., 2021). This is consistent with the extant literature on HPV vaccination cost-effectiveness across countries that implemented it. There was an expectation that Ghana will start HPV vaccination in 2022 using a combination of “school-based vaccinations (80%) and community outreach (20%)” (Vodicka et al., 2021, p. 2), however, this did not happen.

#### **8.4 Governance system in Ghana**

Ghana is a LMIC with 16 administrative regions and a population of about 31,072,945 in 2020 (World Bank, 2021). Ghana was one of the first nation in the sub-Saharan Africa region to gain independence from British Colonial rule in 1957. Despite a few coup d'états in the history of the country, Ghana enjoys relatively stable democratic governance in the sub-Saharan Region, more so since its Fourth Republic in 1992. As a democratic nation, expectations exist that this will be reflected in improved social welfare (Haynes, 1993; Carbone, 2011, 2012; Paller, 2019).

Democracy thrives on inclusivity and collective participation, sometimes referred to as citizen governance (Simmons et al., 2007; John, 2009; Fung, 2015). In Ghana, evidence exists that the political practice involves a “winner-takes-all” (WTA) politics (Gyampo, 2015, 2016; Ijon,

2018). This system of governance, however, is not unique to Ghana; it provides an understanding of how social issues are shaped and gain attention from the incumbent government. While some have explained WTA within the confines of political elections (Dyck, 2006; Florey, 2017; Hacker & Pierson, 2018), WTA gains a different outlook in the context of governance as a political behavior (Attafuah, 2013; Gyampo & Graham, 2017). WTA represents a majority in government system. The control of political power by the incumbent can be used to disproportionately discriminate on partisan lines, thus, using the power of the majority in parliament as a tool to manipulate policy and in addressing social issues. According to Gyampo, this can be the absolute control of state resources (both tangible and intangible) and the deliberate “exclusion of political opponents from national governance” (Gyampo, 2015, p. 17). While non-incumbent party representatives in the legislature may be active in policymaking, the power of the incumbent majority representatives in the legislature by itself becomes a technical political tool to sideline non-incumbents. Thus, by policies that are of interest to incumbent are more likely to gain the political will and attention for action, while those that are of less interest are less likely to gain sustain incumbent traction for action. In a later work, Gyampo stresses that WTA politics can be “extremely divisive”, as it dissociates non-party members from contributing to national governance, thus diminishing and/or disregarding useful human capital resources needful for national development (Gyampo, 2016, p. 2). While WTA may be rewarding as a political mechanism for incumbent governments, it becomes a penal political apparatus for tactical exclusion, thus expanding inequity and promoting despondency in a section of the population that are on the opposite side of the party in power. For some of these reasons, classical thinkers like Plato, Hegel, Socrates, Aristotle, and others were perceived to be dismissive of the legitimization



of politics where numbers rule (majority wins) because of its implication on governance and how elected officials make decisions.

#### ***8.4.1 Chieftaincy as an apolitical policymaking buffer***

It has been noted that chieftaincy is “the bedrock of Ghanaian society” dating back to pre-colonial and post-colonial eras with resilience and cultural fortitude that continue to thrive (Owusu-Mensah, 2014, p. 262). According to the Ghana 2008 Chieftaincy Act 759, a chief is an elected or selected and enstooled, enskinned, or installed person “from [an] appropriate family and lineage” in alignment with the prevailing customary laws to lead a group within a jurisdiction. According to the 1992 Constitution, the prevailing customary laws are rules of law by custom that are applicable to communities. In the pre-colonial era, chieftaincy as an institution was the center of political power. The chieftaincy power base, however, weakened during the colonial era with the introduction of the British Westminster system overshadowing the chieftaincy institution. While the Westminster system of governance was retained as the core governing system in the post-colonial era, the resiliency of the chieftaincy institution has gained prominence in the Ghanaian political landscape with active integration of traditional chiefs in the democratic process of governance as apolitical entities (Boafo-Arthur, 2001, 2003; Owusu-Mensah, 2014; Marfo & Musah, 2018). The 1992 Constitution expects chiefs to be apolitical, as they serve as mediators and government policy promoters within their jurisdictions. The chiefs are allowed to serve on government institutional bodies in various capacities such as commissions, committees, boards, and policy planning.

#### ***8.4.2 Power devolution and governance***

Prior to the 1992 Constitution, governance was vertical, from the central government to the people, even though the idea of decentralization was in the planning stages in 1988, in accordance with the Provisional National Defence Council Law (PNDCL) 207 (Crawford, 2009).

Decentralization is the political process whereby a central government devolves some of its powers to less powerful layers of the government to expedite decision making and developments. Devolution promotes inclusivity and political participation at levels that promise political inclusivity. In an attempt to distance from centralizing political power, the 1992 Constitution emphasized decentralization as a critical political tool to sustain the nation's new democratic pathway (Crawford, 2009; Carbone, 2012). In 1993, the central government officially embraced a decentralized government system whereby local governments took ownership of governance within their jurisdiction while being accountable to the central government for performance of publicly funded government projects in respective regions. While decentralization is touted within the political landscape as a way of diffusing power and allowing local governments to take ownerships of governance, the central government finds ways to obstruct the process through structural obstacles such as administrative, legal, and fiscal constraints (Crawford, 2009, p. 57). Even though the central government reluctantly devolves part of its power to local government, the incumbent remains sophisticated in how political power is used to sideline competent individuals who are not part of the incumbent through party membership (Gyampo, 2015, 2016; Ijon, 2018). This feeds into the vicious cycle of the WTA syndrome trickling down to the lower hierarchy of government. This, according to Crawford, is "unlikely to change given the built-in advantages" to incumbent governments (Crawford, 2009, p. 57).

#### ***8.4.3 Women and governance in Ghana***

The 1992 Constitution again points to non-discrimination in governance participation on gender lines. While that is the case, women's participation in Ghana's political landscape is quite recent. Women have been traditionally sidelined in politics as the political landscape in Ghana has been more patriarchal with dotted presence of women empowerment programs as part of the

progressive affirmative actions (gender equality) to accommodate women in decision making (Anyidoho & Manuh, 2010; Bawa & Sanyare, 2013; Appiah, 2015; George & Braimah, 2021). This observation is not uncommon in many LMICs where women have been perceived to be homemakers rather than solving public problems, which have been the preserve of men (Purkayastha, 1999; Habiba et al., 2016; Bako & Syed, 2018; Onwutuebe, 2019). This marginalization arises from sociocultural constructs, power dynamics, economic, religious beliefs, and many such markers that are sometimes jurisdictionally unique. In 2000, Ghana inaugurated the Ministry of Women's and Children's Affairs (MOWAC) as the arm of government responsible for women and children's welfare. This initiative is leveling out the political landscape and gradually opening the political doors for more women representatives to participate in governmental decision-making processes. According to Anyidoho & Manuh, this participation is precipitated by either political ideological views to be more gender balanced, or because of demands from external forces such as donor countries and NGOs (Anyidoho & Manuh, 2010, p. 267). With an increasing number of women in government, it is expected that policies on women's health will gain attention.

Generally, a lack of political saliency and indifference to social issues on the part of the central policymaking actors, such as government and/or its agencies, can stifle progress in addressing public needs and, as a corollary, stretches existing difficult conditions of citizens. It is apparent that as the politics in Ghana traverses on WTA, the apolitical participation of chiefs can serve as political buffers to diffuse political tensions or bridge differences in viewpoints and introduce alternative solutions or ideas into incumbent government policies and programs that improve the material conditions of citizens.

## **8.5 Healthcare and health insurance system in Ghana**

Through an Act of Parliament (ACT 650), the National Health Insurance Act (NHIA), Ghana became the first country in the sub-Saharan African region to introduce a National Health Insurance Scheme (NHIS). Until 2003, when Ghana passed into law the NHIS, healthcare in Ghana was traditionally constructed by the IMF and World Bank to be covered out-of-pocket at the point of service (Kusi-Ampofo et al., 2015, p. 215). The out-of-pocket healthcare system (a.k.a. Cash-and-Carry) indirectly burdened families and created economic hardships for many people (Carbone, 2011; Kwarteng et al., 2020). The out-of-pocket healthcare delivery policy was a way of public financing of healthcare in the era when most poor nations were guided by the IMF and World Bank Structural Adjustment Program (Carbone, 2011; Kusi-Ampofo et al., 2015; Kpessa-Whyte, 2018; Oppong, 2018). The switch from out-of-pocket to a NHIS was due to a political promise to prioritize health made by the New Patriotic Party (NPP) during the 2000 general election to wrestle power from the incumbent party in power at the time, the New Democratic Congress (NDC) (Kusi-Ampofo et al., 2015, p. 199). The Act became fully functional in 2004, and, by 2012, an amendment was made (ACT 650, Amended Act 852), which required every Ghanaian to enroll in at least one form of a health insurance scheme (Alhassan et al., 2016; Kwarteng et al., 2020). The plan of the NHIS was to remove financial barriers preventing access to healthcare especially for those who could not afford health insurance, and planned that within the first five years of the program implementation, all citizens would be enrolled (Agyepong & Adjei, 2008; Kusi-Ampofo et al., 2015; Kwarteng et al., 2020). NHIS was designed to remove the financial burden of citizens for about 95% of the common diseases (Kwarteng et al., 2020, p. 2). The scheme is sponsored through the National Health Insurance Fund (NHIF), which is funded from a 2.5% goods and services tax levied against the National Health Insurance Levy; a 2.5% of Social Security and National Insurance Trust (SSNIT) contribution deducted from salaries of

citizens in formal sectors, premiums, and donor fundings (Alhassan et al., 2016, p. 2). It is important to note that while the NHIS does not cover expensive cancer treatment, it covers treatment for cervical cancer.

In a study to assess coverage of the NHIS in underserved communities in Ghana, it was identified that the majority of people in rural settings are unable to enroll in the NHIS because of subscription charges for enrollment (Kwarteng et al., 2020). A similar study that gauged the effects of NHIS on healthcare utilization and out-of-pocket payment noted that nearly half of the population are not enrolled, and for those who were (52% of the population) nearly 30% dropped out for several reasons (Sarkodie, 2021, p. 6). While this is the case, the scheme increased healthcare utilization by 26%, and at the same time decreased out-of-pocket payment by only 4% (Sarkodie, 2021, p. 9). In an earlier assessment of the NHIS, Seddoh and Akor posit that, while citizens who are gainfully employed receive free care, the poor pay for their healthcare services because they cannot pay to enrol into the NHIS program (Seddoh & Akor, 2012, p. 10). In a study to estimate the stability of the NHIS, the authors noted that there are financial and operational issues, poor technical capacity, and political interference, amidst other such challenges, that threaten to “collapse the scheme” (Alhassan et al., 2016, p. 1). The NHIS is not perfect and has its challenges, however, the scheme presents a starting point for citizens’ enjoyment of the right to health.

## **8.6 Health priority setting and policymaking process**

Resource allocation for health in Ghana is relatively small compared to other sub-Saharan African countries. This is due to competing government budgetary allocation and economic interest (Asante et al., 2006; Asante & Zwi, 2009; Atuilik et al., 2019; Ayandipo et al., 2020). The MOH in Ghana reports that, “government budgetary allocation still lags behind the agreed Abuja target of 15% of national spending on health” (MOH, 2017, p. 22). Ghana is a signatory of the

Abuja Declaration adopted in September 2000. In 2001, leaders of the African Union met and decided to commit at least “15% of their annual budget to improve the health sector” (WHO, 2011, p. 1). According to Asante and colleagues, health resource allocation within and among the regions in Ghana has not been equitable (Asante et al., 2006, p. 137). The Ghana MOH acknowledges this in its report, *The Health Sector Medium-Term Development Plan 2014-2017*, noting that health continues to remain inequitable as far as financial and geographical access is concern (MOH, 2017, p. 9). The MOH pointed out “[n]on alignment of resource allocation with health sector priority areas has been identified as a major barrier to achieving set targets in the [health] sector” (ibid, p.22). This is not uncommon in many LMICs. When it comes to health equity, it is not how much government resources are spent but rather how these resources are spent. The MOH states that as part of its health sector medium term goals,

“... it seeks to improve the overall health status of Ghanaians by reducing the risk of ill health and preventable death thereby contributing to the nation’s wealth. The health sector aims to achieve this through an efficient health system, which can deliver an internationally acceptable standard of health service. This will be done through improved infrastructure, ensuring equity in the distribution of health resources and the strengthening of health systems and services at all levels” (MOH, 2017, p. 24).

The health policymaking process in Ghana is unsurprisingly fraught with a large presence of international and local actors. According to Koduah and colleagues, during dialogue process, international donors “gained legal and structural access to national policymaking process” (Koduah et al., 2016, p. 80). While health policymaking is highly institutionalized and uses evidence to formulate health policies, the process unhinderedly allows external actors into the policy network (Kusi-Ampofo et al., 2015; Koduah et al., 2016). The MOH are the core actor in health policymaking processes and are responsible for moderating the process, organizing ideas, negotiating these ideas, and recording the decision made in Aide Memoire (Koduah et al., 2016,

p. 80). To understand the HPV vaccination and cervical cancer situation in Ghana and the policymaking milieu, primary data from interviews and online questionnaires were used to delineate the current situation.

## **8.7 Theoretical lens**

Actor-network theory (ANT) is applied as the theoretical framework to understand the Ghana HPV vaccination and the policymaking milieu. This is because of ANT effectiveness as an evaluative tool for assessing actors' actions within various levels (networks) of influence in the social space. Policymaking for social problem in Ghana, like in many other countries, involves diverse actors who possess and wield power in different forms to influence policy and/or reforms. ANT is predicated on the fact that the action of actors determines outcomes and actors could be entities with power to dominate, or agents without initiatives, that allows themselves to be dominated (Latour, 1996; Callon, 1999; John, 2009). The theory perceives the world as consisting of networks, where all actors function within their unit networks either by will or implicit compulsion (Callon & Law, 1986; Latour, 1994; John, 2009; Bilodeau & Potvin, 2018). As pointed out by Bilodeau & Potvin, "ANT is a powerful theoretical tool" in that it proposes "a relational view of action" (2018, p.175). The framework proposes that the actor configuration and the number of connections through which they are linked "determines what the actor is, wants, and can do" (Callon, 1999, p. 185). The theory also make consideration of "actor's size, its psychological make-up, and the motivation behind its actions" (Callon, 1999, p. 181), and aids in gathering "relevant components in a situation" (Bilodeau & Potvin, 2018, p. 175). For example, the role of the actors, their financial resource, values, beliefs, norms, culture etc. It can also be used to analyze "strategic positions and power relationships, points of convergence and divergence with regards to the situation in question" (ibid).

## **8.8 Ethical approval**

Ethical approval was obtained from the Human Participants Review Sub-Committee, York University's Ethics Review Board, Office of Research Ethics (ORE). ORE attest that the research conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. The ethics approval certificate for this research is #: STU 2021-137.

## **8.9 Confidentiality**

For both interviews and web-based questionnaires (Google Forms), participants were assured of confidentiality. In the case of web-based survey questionnaires, emails and the first names of participant were collected. This was to provide contact tracing when it became necessary to reach out to a participant. For example, when further clarification on any question answered is needed to better inform the research question. The emails and first names collected are not made available to third parties or referenced in the research results.

## **8.10 Methodology**

### ***8.10.1 Online surveys***

Google Form was used to create the survey questions. A hyperlink to the Google Form was shared electronically through emails to individuals and to WhatsApp group pages, between 21 December 2021 to 15 March 2022. Participants were encouraged to share the hyperlink of the web-based questionnaire to other people or social platforms that they felt qualify to complete the forms. This snowballing effect increased the number of participants for the survey. Informed consent for the web-based survey was made part of the first page of the survey. Participants were requested to read the study description and consent form and by answering and submitting their responses, consented to become participants on the first page of the survey. Participants for the survey were diverse in terms of education, socioeconomic status, age, and sex. This broad representation provided a good sampling of the general populace and public opinion. The



eligibility criteria were that participants must be residents of Ghana, be at least 18 years old, be reasonably sound to comprehend social issues. Non-resident Ghanaians who completed the survey were excluded.

The design of the survey questionnaires did not follow any particular template, however, questions such as “have you heard of HPV”, “have you heard of HPV vaccine”, “have you ever received the HPV vaccine”, have been asked in previous works (Williams et al., 2019; Drokow et al., 2020). Questions were phrased in simple English language for ease of comprehension and to get a broader response from participants. Information on gender, age, education, and employment were collected and where possible, used as independent variables in descriptive statistics for correlations. To evaluate the level of overall risk to HPV-related cervical cancer, respondents were asked the age of debuted sexual experience.

The level of HPV awareness was evaluated with simply phrased questions that asked about awareness of HPV, where information was coming from, knowledge of HPV infection spreading through sex, and knowledge of some genotype of HPV causing cervical cancer. Evaluation of HPV vaccine awareness was assessed by asking respondent if they were aware a vaccine exists and knowledge of a nationwide HPV vaccination program. With vaccine hesitancy on the rise, participants were asked if they had taken the HPV vaccine, or whether they intend to take it in the future should it be introduced by the government. To evaluate government resource allocation to health and priority settings, respondents were asked whether they think the government has the resources to conduct a nationwide HPV vaccination for those who need it, whether the government is committed to public education on HPV-related cervical cancer, and whether women’s health was a governmental priority. Evaluation of respondent’s knowledge on cervical cancer policy and governments priority settings is assessed by asking respondents of their knowledge of a policy on

cervical cancer prevention and control, and the government's commitment to prioritizing cervical cancer prevention.

Health is a fundamental human right. To access the perspective on this, respondents were also asked whether they have ever demanded their right to health at any time in their life. The Google Forms data were exported into an Excel file and saved on the researcher's laptop which is password protected. The saved Excel file was exported into IBM Statistical software for Social Sciences (SPSS) (version 28.0) to organize the data and provide statistical descriptions and interpretation where necessary. IBM SPSS was used to conduct descriptive statistics such as frequencies, and Fischer's exact test as an alternative to chi-square test of independence was used.

The detail of the online survey is presented in appendix 4, while the statistical analysis of survey results is presented in appendix 8.

### ***8.10.2 Interviews***

Key informants were recruited first by using Google search to identify stakeholders with interest in cervical cancer prevention and control in Ghana. A list of potential stakeholders were first put together and emailed to seek their participation. Contacted persons were also requested to suggest other stakeholders they deemed important informants for the study who were also contacted through a snowball search. Upon acceptance to be a participant, they were sent a formal invitation request, interview guide, interview strategy, copy of ethical review approval certificate, and consent form. Participants understood their role in the study prior to participating in the interview. Key informants could choose to participate either in an online interview via Zoom or complete the interview questions and send them to the interviewer through the researcher's institution email address. Participants were anonymized and coded. Anonymization was based on country of the participant (Ghana is represented as GH), a randomized number in hundred series, (e.g., 001, 002, 003...nth), designated affiliation (e.g., Advocacy group is AGP, Academic is

ACA, Physician is PHY, politician is POL, Media is MED). For example, a participant in an advocacy group is coded as GH-001-AGP, GH-002-AGP ...nth). Where necessary for clarity, words were inserted into interview responses as (represented by [square brackets] or removed (represented by ...). Eight interviews were conducted overall. Two respondents were interviewed in person. One interview was conducted via Zoom, which was audio and video recorded with the respondent's permission. The voice recording was transcribed using rev.com. The transcribed results from rev.com were crosschecked for omissions and transcription errors, and manually corrected. Five anonymized respondents consented to participation by completed structured questionnaires and returned their responses by email. NVivo 12 was used for data coding and identification of categories from interview responses to deduce themes for analysis. The qualitative codes were generated iteratively to organize categories, sub-categories, and then identify themes. Codes were cleaned by removing duplicates, merging sub-categories, and refining them to establish clear themes. Six themes were developed from the NVivo 12 analysis: awareness, media influence in vaccine uptake, policymaking, priority setting, resource allocation, and right to health. While the media influence in vaccine uptake theme was highly referenced as shown in the NVivo analysis, it is a sub-category of the "awareness" theme. Media influence is considered as a tool for awareness of HPV-related cervical cancer. Priority settings and resource allocation sub-themes are combined and treated as one theme, as these two themes have a direct relation to governmental power to mobilize resources using state apparatus. The right to health as a theme speaks into individuals' ability to exercise their fundamental right to health. This theme is treated in isolation to conjecture the disposition on how citizens demand their right to health. The details of the interview questions are presented in appendix 5, while the Nvivo coding and analysis of the interviews is presented in appendix 8.

## 8.11 Findings

A total of 215 responses were received from the web-based Google Form survey. Of these, 14 responses were excluded because the respondents indicated their residence as outside of Ghana. Chi-square tests were used to test relationships between variables and measures of relationships were interpreted using Phi's co-efficient. In all, 201 survey responses were counted as valid of which 64 (31.8%) represented male respondents and 137 (68.2%) represented female respondents. Some respondents did not answer all questions, and these were counted as missing. The data collected were grouped and bracketed based on the questions asked. Majority of the respondents were over 26 years (58 (90.6%) men and 132 (96.4%) female). 53 (84.1%) male and 111 (81.0%) female respondents had completed university and only 5 (0.03%) respondents had high school education. Educational status was weakly correlated to government's commitment to cervical cancer prevention ( $Phi (\phi c) = 0.303$ ,  $p\text{-value} = 0.019$ ), awareness of HPV-related cervical cancer ( $Phi (\phi c) = 0.389$ ,  $p\text{-value} = 0.000$ ), and HPV vaccine awareness ( $Phi (\phi c) = 0.368$ ,  $p\text{-value} = 0.001$ ). However, correlation of education with other variables, such as willingness to vaccinate, awareness of policy on cervical cancer prevention, government resource allocation, and right to health, gave statistically insignificant outcomes ( $p\text{-value} > 0.05$ ).

35 (17.4%) of 198 valid respondents chose not to answer the question regarding age of debut sex. While that is the case, 14 (7%) indicated debuting sex before age 17, out of which 70% indicated awareness of HPV. The relationship between debuting sex and awareness of HPV was however shown to be weak ( $Phi (\phi c) = 0.271$ ,  $p\text{-value} = 0.070$ ). Majority of respondents, 44 (69%) men and 95 (69.3%) female debuted sex after 17 years. 163 (81.1%) of the 201 respondents are aware of or had heard about HPV through various means, such as self-reading (15.9%), internet (13.4%), school (28.4%), privately-owned radio station (12.9%), and national education program (9.5%). The most used medium of HPV awareness is through schools is 28.4%, with (82.5% of

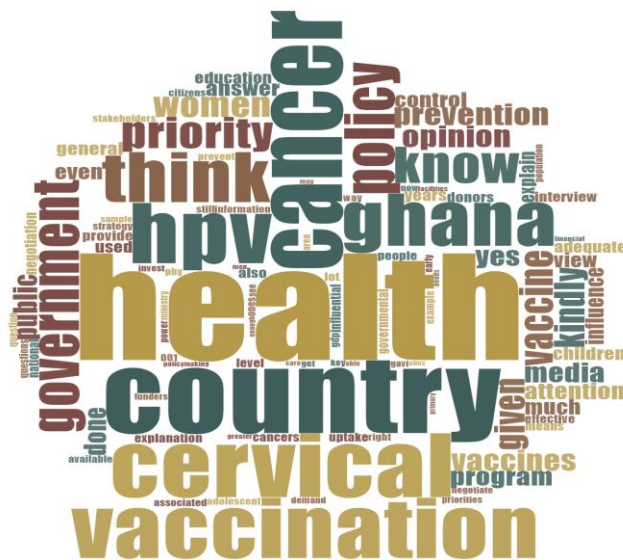
females and 17.5% males). Majority of males received HPV awareness through self reading (N=11). The least used medium for HPV awareness is government-owned radio station (0.5%) and government-owned TV station (1.0%). Meanwhile, the relationship between gender and medium of HPV awareness is statistically insignificant ( $p\text{-value}=0.064$ ). 154 (76.6%) (38 men, 116 female) of the 201 respondents are aware HPV infection can be spread through sex, and only 8 (4.0%) are not sure. Out of 168 respondents, only 14 (7%) have taken the HPV vaccination. 129 (64.2%) respondents (26 men, 103 female) are willing to take the HPV vaccine when it is introduced in Ghana, while 19 (9.5%) indicated they will not take it. 34 (16.9%) (21 men, 13 female) are not sure whether they will take it or not. Overall, the relationship between gender and willingness to vaccinate was statistically significant ( $Phi (\varphi c) =0.379, p\text{-value}=0.00$ ).

To evaluate whether respondents believe the government will introduce HPV vaccination at some point, only 63 (31.3%) (15 men, 48 female) of 171 respondents think it is possible, while 94 (46.8%) (38 men, 56 female) remain unsure. While that is the case, 83 (41.3%) (29 men, 54 female) of 201 respondents think the government has the resources to conduct a nationwide HPV vaccination for those who need it. 56 (27.9%) (14 men, 42 female) think otherwise, while 62 (30.8%) (21 men, 41 female) are unsure. 143 (71.1%) (43 men, 100 female) of 201 respondents are of the view that the government's effort to educate the public on HPV-related cervical cancer is inadequate. Only 26 (12.9%) (6 men, 20 female) think otherwise. A fair number of respondents, 92 (45.8%) (15 men, 45 female) of 200 respondents are of the view that the government is not committed to prioritizing cervical cancer prevention in Ghana. 49 (24.4%) of respondents, however, think otherwise with 29.4% of these respondents not sure if the government is committed or not in prioritizing cervical cancer prevention. There was a strong relationship between government commitment to cervical cancer prevention and public education ( $Phi (\varphi c) =0.515, p\text{-}$

*value=0.00*). When it comes to women's health and government priority setting, responses are nearly split, 78 (38.8%) (31 men, 47 female) of 201 respondents say government prioritizes women's health, 60 (29.9%) (15 men, 45 female) think otherwise, while 63 (31.3%) (18 men, 45 female) are unsure of the government's priority on women's health. There was a strong relationship between women's health prioritization and government's commitment to cervical cancer prevention ( $Phi (\phi_c) = 0.666, p\text{-value} = 0.00$ ). While 75 (37.3%) (18 men, 57 female) of 201 respondents were aware of a specific policy on cervical cancer prevention and control, 124 (61.7%) (46 men, 78 female) were not aware of existing specific policy on cervical cancer prevention and control. The relationship between women's health prioritization and policy on cervical cancer prevention and control is statistically significant ( $Phi (\phi_c) = 0.272, p\text{-value} = 0.01$ ). 91 (45.3%) (29 male, 65 female) of 199 respondents claim to have demanded their right to health at some point in their life in Ghana, while 108 (53.7%) (35 male, 73 female) have not done so. None of the sociodemographic factors (age, gender, highest education level, employment) had a statistically significant relationship to right to health ( $p\text{-value} > 0.05$ ). However, the relationship between women's health prioritization and right to health was statistically significant ( $Phi (\phi_c) = 0.301, p\text{-value} = 0.00$ ).

Figure 8 shows the word cloud generated from the Nvivo analysis. The word cloud conspicuously brings out health, government, vaccination, cervical, cancer, policy, and priority. The word cloud alludes to a convergent view among the interview informants, thus, indicating the context areas of concern that should be addressed for cervical cancer prevention and control in Ghana. The full details of the research data are presented in appendix 8.

Figure 8: Word cloud for interviews



## 8.12 Discussion

### 8.12.1 Vaccination success predictors

Correlations between variables of interest were ascertained using chi-square test of independence. However, because of the small size of the sample, Phi’s coefficient of correlation was used to ascertain the strength of association. Phi coefficient is a chi-square-based measure of association that adjusts the chi-square coefficient to factor out sample size. Thus, the assumption of the chi-square test for a 2 by 2 table to have cells with expected count greater than 5 is adjusted for by the phi coefficient.

Early sexual debut refers to sexual encounter before the age of 14 (Richter et al., 2015, p. 304). According to a 2019 UNESCO’s country report on Ghana, 11,366,000 (37.4%) out of a population of 30,418,000, representing one-third of the population (37.4%) are 14 years and younger (Unesco, 2022). The existing literature reports that about 60% of young women and 45% of young men in sub-Saharan Africa debut sex before their 18<sup>th</sup> birthday (Stephenson et al., 2014, p. 161). In Ghana, it is reported that about 57% of young people initiate sex before they are 18

years (Alhassan et al., 2021, p. 5). In another study on timing of sexual debut among 15-17 years old in Ghana, it is noted that 25% (N=1,162) of male at the mean age of 17, and 22% (N=1,820) of female at the mean age of 16 were sexually active (Tenkorang et al., 2021, p. 1269).

This study shows that about 69% of respondents debut sex after age 17 and only a very small number debut sex before age 17 (7%). This outcome is consistent with the recent HPV and related cancer fact sheets for 2021 on Ghana by the ICO/IARC Information Centre on HPV and Cancer (ICO/IARC, 2021). According to the ICO/IARC report, 9.3% of men and 11.8% of women indicated debuting sex on or before their 15<sup>th</sup> birthday (ibid). Thus, only a small number of Ghanaians debut sex before their 14<sup>th</sup> birthday. The relatively large number of adolescent populations under age 14 (<30%) presents a double bind for government to act as HPV vaccines are prophylactically more potent prior to debuting sex. As is the expectation from this study and the ICO/IARC report, many adolescents are likely not to have debuted sex on or before age 15. This is the window of opportunity for the government not to miss.

A correlation between vaccine hesitancy and vaccine confidence also exists. When people are confident in a vaccine, hesitancy drops in inverse proportion. In the same manner, when people are not confident about a vaccine, they are hesitant, delay, or resist vaccination. The WHO's Strategic Advisory Group of Experts (SAGE) on Immunization Working Group adopt a three-model approach, the 3C (confidence, convenience, complacency) model to tackle vaccine hesitancy. The model put forward the idea that there must be confidence that the vaccine is safe and efficacious, and that healthcare professionals who will administer the vaccines are competent to do so. The convenience of the model deals with issues of access and affordability. The last consideration deals with complacency on the grounds that the vaccine uptake is low. This might be due to the disease being downgraded either because it affects a small population, or it has a low



mortality and morbidity rate (Oduwole et al., 2019, p. 2). The research survey has shown that there is a high vaccine confidence level among respondents. While only 14 (7%) (1 male, 13 female) of 168 respondents have had the HPV vaccination, 64.2% (26 male, 103 female) are willing to take the shot once it is nationally introduced. The relationship between gender and the willingness to vaccinate was statistically significant ( $\Phi$  ( $\phi c$ ) = 0.379,  $p$ -value = 0.00). The statistical indications is assumed to assert that willingness to be vaccinated orients a position that a nationwide HPV vaccination program is potentially poised to succeed once a policy framework is set in place for execution.

### **8.12.2 Awareness of HPV**

The World Bank reports that, in 2018, Ghana's literacy rate was 79.04% (World Bank, 2021a), which is above the 2018 literacy rate (65.039%) and 2020 literacy rates (66%) for the sub-Saharan Africa region (ibid). Awareness of HPV and mode of transmission is very high among educated people. The different learning tools, such as the internet, increasing radio and online TV channels, and mobile phone platforms such as WhatsApp groups are some of the channels for information dissemination. In a study of 288 Ghanaian women on HPV awareness, Williams and colleagues showed that about 57% of educated women have heard about HPV vaccine while less educated women responded not hearing about the vaccine (Williams et al., 2019, p. 899). Previous studies have reported otherwise, for example, a systematic review on constraints to HPV vaccination noted that "inadequate community sensitization about HPV vaccine" was a constraint to awareness in Ghana (Amponsah-Dacosta et al., 2020, p. 711). The literature on awareness of HPV, HPV vaccination, and cervical cancer has been historically reported to be low for the past decade or so in Ghana. For example, previous studies among healthcare workers (Agyei-Baffour et al., 2020; Ebu et al., 2021), high school/college students (Ampofo et al., 2020; Manortey & Agyemang, 2018), women (Williams et al., 2019), men (Williams & Amoateng, 2012), and mixed

cohorts (Adanu, 2002), have all pointed to low awareness levels. Interview participant, GH-001-PHY, re-emphasised some of these studies stating,

“...The health workers themselves are not even aware about it [i.e., HPV and HPV related cervical cancer] and are not so much informed about it, so how much more [i.e., health workers] giving the information out. So, there's a deficit there...”

In recognizing the deficit in awareness creation, the increasing number of Ghanaians who are becoming aware of HPV infections and HPV-related cervical cancer is instructive to the overall cervical cancer awareness. Underscoring this, a women's group key informant GH-001WGP noted that,

“...information [i.e. on HPV and cervical cancer] that is released by official sources, such as the Ghana Health Service [GHS], should be promoted on news websites and mass media channels, such as radio, newspapers, and TV, as well as by using Facebook ads, which guarantees wide reach and engagement”.

According to GH-001WGP, “... in order to educate women, people with specific religious (e.g., religious leaders) or political beliefs, and people living in urban communities, with the goal to increase knowledge and trust in vaccines, targeted programs such as community outreach and media campaigns [must be developed]”.

The SPSS descriptive analysis gave statistically significant correlation between gender and medium of HPV awareness ( $p\text{-value}=0.079$ ). This outcome is instructive, even though not definitive, as it expresses confidence in overall awareness creation.

### **8.12.3 Priority settings and resource allocation**

One physician key informant (GH-001-PHY) was of the view that Ghana is not deficient in policymaking, however, the problem lies in implementation of the policies stated,

“we [i.e., Ghana] have all the good policies, like the cancer control policy in 2010, excellent policy! The problem is implementing it. And it has always been put on the lack of funds. So, I wouldn't say we lack the policies. For the policies we have about the best you can think about. We have a very good cancer control policy for over a decade, but they've not been implemented. We know who to screen, we know who to vaccinate. They are all in the policy, but it has never been implemented because we blame it on the lack of funds. So, I wouldn't say that we don't have the capacity to make the policy. The problem is the implementation. that has been a problem.”

In similar response to the role of policymakers and their influence in HPV vaccination in Ghana, GH-001-WGP pointed out that,

“[t]he Ghana Health Service (GHS) and some health-related civil society organizations have the power to influence HPV vaccination in Ghana. The development of a “National Strategy for Cancer Control and prevention policy” by the GHS and ability to influence public education in Ghana, is a great stride.

Despite this, GH-001WGP assert that, “much is expected to be done”. While this is the case, GH-003-PHY asserted that when it comes to government attention to cervical cancer prevention, “[T]here is no effective cervical cancer prevention programme in Ghana.”

According to GH-003-PHY,

“The policy on control of cervical cancer expired in 2016 and as of now, no functional policy. There is non-existent program on cervical cancer control”.

These assertions subscribe to low government commitment to prevention and control of cervical cancer. Government commitment and political will to promote health is critical to a nation’s human capital growth. This is because prioritization of health by government creates a shared value for government and citizens with the result of enabling healthy workforce for economic growth. Government commitment to prioritizing cervical cancer prevention has been viewed as low among respondents. Only 24.4% of survey respondents think the government is committed, with another small number of respondents (31.3%) holding the view that the government will introduce HPV vaccine at some point in the country. Not surprisingly, 41.3% of respondents are of the view the government has the resource to conduct a national HPV vaccination. This low percentage communicates a public lack of confidence in government due to insufficient political will to act. However, the study gave a significant correlation between government commitment to cervical cancer prevention and public education ( $Phi (\varphi_c) = 0.515$ ,  $p\text{-value} = 0.00$ ), and women’s health prioritization ( $Phi (\varphi_c) = 0.666$ ,  $p\text{-value} = 0.00$ ). These outcomes

may be indicative that, rise in public education and prioritization of women's health is more likely to trigger allocation of resources for cervical cancer prevention; an upshot of which will be a nationwide HPV vaccination program. While this may be stimulating from a policy perspective, it is worth noting that, there was a weak correlation between responses for government prioritization of women's health and awareness of a cervical cancer prevention and control policy ( $\Phi(\varphi c) = 0.272, p\text{-value} = 0.01$ ). There is no clear reason for this, however, it is conjectured that an absence of a specific public policy on cervical cancer reflects a lack of prioritization of women's health.

A survey to show government's effort to improve health in sub-Saharan Africa between March 2008 and June 2009 with 27,713 respondents, revealed that only 20% of participants in Ghana believed the government at the time had health as a priority (Abiola et al., 2011, p. 1484). Not surprisingly, the authors showed that for the countries studied (including Ghana) the public health systems are "weak and suffer from inadequate human and capital resources" (ibid). While this study occurred over a decade ago, the findings are no different from recent studies in Ghana (Kushitor & Boatemaa, 2018; Laar et al., 2019; Amos et al., 2021; Anarwat et al., 2021). The literature is fraught with Ghana having some well-established policy and programmatic responses to chronic NCDs, however, evidence shows that there is a lack of practical attention and political will to act (Basu, 2007; Sanghvi et al., 2008; Edwin, 2010; Asempah, 2020; Kenu et al., 2020). This lack of political will is reflected in the low number of respondents (12.9%) who think the government's effort to educate the public on HPV is adequate as opposed to the large percentage (71.1%) who believe the government is not doing enough.

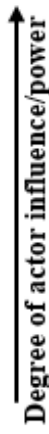

#### ***8.12.4 Political Will and Expediency***

Political will is the commitment policy actors make to achieve defined set of policy actions through political behaviors, such as influencing and controlling the actions of other actors, seeking cooperation, and emotional balancing (Brinkerhoff, 2000; Treadway et al., 2005; Post et al., 2010; Mhazo & Maponga, 2022). This requires intrinsic or extrinsic motivation of actors to drive the need to achieve the desired policy action(s) through tangible (e.g., humans and money) and intangible (e.g., ideas and intents) resource organization (Brinkerhoff, 2000; Post et al., 2010). Political will reflects the intensity of the public problem/issue and how policy actors expand, define, or redefine the scope of conflict areas of the issue. This is a political maneuver as it creates room for alternatives. According to Schattschneider, the definition of alternatives becomes an instrument of power which at once is a choice for conflict (Schattschneider, 1975, p. 68). The choice of conflict, by its appropriation, “allocates power”, which motivates or de-motivates policy actors to assign power through political will to act for a policy change or not (ibid). Whereas the actions of actors shape political will, in some instances, this is motivated by the actor’s desire for power and control, Machiavellianism, and sometimes the lack of personal power; all of which can lead to actor manipulation to bias a particular alternative of choice (Brinkerhoff, 2010; Treadway et al., 2005; Mhazo & Maponga, 2022). Mhazo & Maponga put this as “power over” where an actor or a group of actors have “direct decision-making power over other actors” (Mhazo & Maponga, 2022, p. 5). In his analysis of power from a Foucauldian perspective, Ivan Manokha put this view across as “the ability of an actor A to make an actor B do things (that are, as a rule, in A’s interests) which B would not otherwise have done” (2009, p. 430). By this explanation, advantages are rendered to actor A by changing the behavior or altering the options for actor B.

Motivation at play, political will (conferred through the allocation of power) mobilizes resources and drives policy actions that are perceived to change or resolve public problem(s). Equally, the absence or lack of political will can be indicative of actors, especially elites, calibrating the public issue and positioning cost and benefits of the policy in their individual or collective interest. An outcome of this can be under-prioritization, inadequate resource allocation, and/or sidelining important actors (yet non-elitist) in resolving public issues that are of less interest to elite actors. For example, in a systematic review on the constraints of HPV vaccination in sub-Saharan Africa, the authors noted under the theme “governance and policy landscape” that key government ministries such as Education and Finance were weakly involved (Amponsah-Dacosta et al., 2020, p. 710). The absence of two critical stakeholders, Education (to facilitate education and vaccine uptake) and Finance (to make the resources available), means the general priority for addressing cervical cancer is low on the governmental agenda setting for health. Cervical cancer is a woman’s nightmare. While not neglecting other groups in society, children and women are more vulnerable and must have quick and equitable attention on issues relating to their health. Respondents believed that women’s health in Ghana is of low priority to the government. Only 38.8% are of the view the government makes women’s health a priority. This low number shows the lack of confidence in the government to prioritize women’s health. While this is the case, Reichenbach showed that in Ghana, disease prevention and control prioritization, and governmental visibility for resource allocation is dependent on how the disease is framed (Reichenbach, 2002, p. 55). For example, while the government of Ghana prioritizes technical training and guidelines, including the purchase of expensive mammography equipment for breast cancer, there was no priority set to purchase inexpensive equipment for cervical cancer screening, including tools for pap smear tests (Reichenbach, 2002, p. 54). This is because cervical cancer is perceived as a sexually transmitted

disease that is brought about by risky sexual behaviors. On the other hand, breast cancer receives tremendous local and international support with advocate stakeholders pushing for governmental attention (ibid). While cervical cancer disproportionately affects women of poor socioeconomic status, it is not so for breast cancer. This implies women who have strong economic and political clout are more likely to be affected by breast cancer and are more able to effectively frame, organize, and advocate for breast cancer intervention, in their interest (Reichenbach, 2002; Mhazo & Maponga, 2022). Mhazo and Maponga in their review of 84 published articles have shown that political elites can exert dominance in policymaking that evoke “self-interests at the expense of altruistic choices aimed at public benefit” (Mhazo & Maponga, 2022, p. 10). A classic description of why interest in some public issues is politically organized by some interest group(s) and receives the needed political attention for policy or policy reform, while others do not. Such organization of interest is what Schattschneider put across as “mobilization of bias” (Schattschneider, 1975, p. 30). To understand the dynamics of actors, and probably, how to manage them, A two-fold stakeholder matrix (Table 14) may be used to map actor’s level of interest and their degree of influence in the policymaking process.

**Table 14: Actor interest versus power/influence in policymaking**

 <b>Degree of actor influence/power</b>	<b>Low Interest + High influence.</b> e.g., Powerful elites in society	<b>High Interest + High Influence.</b> e.g., Key actors such as government and its agencies.
	<b>Low Interest + Low influence.</b> e.g., public	<b>High Interest + Low Influence</b> e.g., Socioeconomically underprivileged patients.
 <b>Level of actor interest in public problem</b>		

When public policy with public health benefits presents fiscal implications, they are more likely to be subjected to under-prioritization or receive pushback from actors or interest groups who will benefit less from the policy (Mhazo & Maponga, 2022, p. 5). However, when the benefits are high for powerful actors or elites who can manipulate the policymaking process, political will intensifies. This brings to bear Lowi's theory of policy benefit and cost distribution. In Lowi's view, when policy is distinct, it evokes distinct patterns of politics because the behavior of the actors varies in accordance with the policy under consideration (Lowi, 1964). This is predicated on the assumption that political expectations are determined by policies, and a political relationship is determined by the type of policy at stake (ibid). Given this assumption, Lowi argues from his interest-group policy typology that public policies hinge on distributive (public taxes used to confer benefits to a small, targeted interest group), redistributive (public taxes used to confer benefits for greater good of the public), and regulatory (confers passage of policies and legal regulations and their enforcement) typologies. Thus, a policy that addresses a public problem is dependent on actions of the actors against the backdrop of their benefits. For example, similar to cervical cancer, Ghana currently has a high level of antimicrobial resistance (AMR) cases that threatens public health (Labi et al., 2018; Afriyie et al., 2020; Darby et al., 2021; Tseklevs et al., 2022). However, framing the AMR threat as multisectoral (rather than health) garnered the required actors' support for an AMR policy (Koduah et al., 2021; Mhazo & Maponga, 2022). By framing AMR as multisectoral, the benefits are expanded (redistributive) while reducing conflicts.



**Table 15: Kellow’s view of Lowi’s interest-group theory**

		COST		Public policies receive traction based on the visibility, intensity, and the direction of the public problem (Kellow, 1988; Schattschneider, 1975). Perception of cervical cancer as a sexually transmitted disease (rather than a public health issue) dampens the visibility and the required political intensity (will) for policy action. In
		Public	Private	
BENEFIT	Public	Redistributive	Public Interest Regulatory (Placebo Response)	
	Private	Distributive	Private Interest Regulatory	

Ghana, the social mobilization for cervical cancer prevention (e.g., HPV vaccination) is low or nearly non-existent (Amponsah-Dacosta et al., 2020, p. 711). It can be deduced that even with the under-prioritization of women’s health in general, among diseases of nearly equal mortality and morbidity, there is inequitable health expenditure resource allocation. The inequity extends governments’ inclination to drift towards constructs that appeal to a larger and a strongly knit group with common interests. Consequentially, this inequity stigmatizes one disease over another in the same spectrum of mortality and morbidity.

A physician key informant GH-001-PHY noted that,

“we [i.e., Ghana] are getting around 3,000 cervical cancer cases diagnosed a year [and] about 1,500 around that are dying in a year. That is significant. If you put all together, we have a burden to deal with. It is necessary that we invest our energies [i]n this area [referring to HPV vaccination]”

To emphasize the need to provide attention to cervical cancer, similar to breast cancer, [GH-002-PHY] pointed out that, “[c]ervical cancer and HPV vaccination should be prioritised just as breast cancer is done in Ghana”. While the government remains the central actor in public policymaking,

enhanced intensity in the politics and visibility of a public issue can equally come from organized interest groups who can demonstrate political will (Contandriopoulos et al., 2018; Baum et al., 2022; Mhazo & Maponga, 2022). This implies actors must be studied or evaluated beyond their nuance characteristics (e.g., beliefs and values) with a focus on their collective behavior in the network. Understanding the behavior of policy actors is important in the policymaking process, however, from an ANT perspective, it should not be the “focal point”, rather, the “connection between them [i.e., policy actors] through which they act” (Bilodeau & Potvin, 2018, p. 175). Thus, politics and its overlay with power to manipulate behaviors, controls available options, and formulates policies for society, advertently disadvantages some groups while increasing the advantages for another group. It perpetuates “systematic inequality [that] flow[s] from membership in one class rather than another” (Williams & Collins, 1995, p. 377). In essence, actions or inactions of governments or interest groups by themselves become policies that practically block opportunities to quality health. The policy actors with the ability to allocate power and confer political will directly create inequity in health as those who cannot afford the HPV vaccine become disenfranchised further. A lack of access to resources or its mobilization by actors defines influence and how power is allocated. By itself, this explains inequity in health as it can block opportunities that yield beneficial outcome to those without power or resources to change or reform a policy (Potvin & Clavier, 2013, p. 82).

#### ***8.12.5 Policy accountability***

Diverse actors with diverse levels of political power exist in Ghana. Those unable to effectively mobilize resources and allocated minimal political power to influence policy by virtue of their socioeconomic and political positions tolerate inequitable policy or reforms. This undermines the right to health and can result in lax accountability, especially from government.

When government loses sight of a public problem due to competing interests, it reflects policy inertia and a low level of accountability to the people. Baum and colleagues summarize this and point out that for public policies or reforms that present the “the greatest potential to reduce inequalities, they generate the least political will as they threaten those benefiting from the status quo” (Baum et al., 2022, p. 3).

Accountability can be explained as the social relationship or contract in which an agent (in this case government) is held responsible to answer for performance expected by a significant stakeholder or party (in this case the citizens) (Robinson, 2003; Romzek & Dubnick, 2018). According to Tuohy, accountability hinges on identifying responsibility of action or inaction for those “whom to hold accountable for what”, provision of information influencing outcomes of decisions by those vested with the fiducial power to be responsible for them (not necessarily making the decisions), and mechanisms to penalize or reward performances of set goals (Tuohy, 2003, p. 196). Within the public domain, there is an “empirically observable phenomena” associated with it (Romzek & Dubnick, 2018, p. 382). This means there must be proof of action to function towards the duty to perform with either tangible or intangible signs at the time of evaluation. Wherein the performance of the relevant government agency’s responsibility to perform as expected by the people remains unmet, the lack of political will or suboptimal performance is reflected in the lived experiences of the people. For example, the National Strategy for Cervical Cancer Control in Ghana 2012-2016, among many promises, indicates that “Catch up immunisations [HPV vaccine] will be provided for girls aged 15 -18 years” (MOH, 2011, p. 17) However, no evidence exists that a process is in place or will commence in the future.

It is important for governments to be accountable for their actions or inactions even though accountability may come with the risk of blame-gaming. Because of this, accountable entities or

stakeholders may want to move away or make excuses from expectations or performance failure for reasons that may/or may not necessarily be attributable to their actions or inactions (Romzek & Dubnick, 2018, p. 385). For this reason, accountable entities must have evaluative and monitoring systems that assure their performance to the people they serve. In Ghana, the auditor general serves this role.

#### **8.12.6 Right to health**

For a preventable disease such as cervical cancer, where intervention exist, the lack of attention and resource allocation to prevent the disease makes it a health equity and a human rights problem (Erdman, 2009, p. 369). There was statistically no significant correlation between the sociodemographic factors (age, education, gender, employment) and right to health ( $p$ -value  $>0.05$ ), indicating that right to health is independent of social and demographic characteristics. Over 50% of survey respondents indicated they had not asserted to their right to health at any time in their life. This may be indicative of a society of relatively passive population that are less likely to use social and/or political tools available to them to demand that the government abide by the WHO's mandate of the right to health and prioritize health as a fundamental human right. While this can cause governments to shift focus from health or reduce resource allocation to health, it inversely burdens society with preventable or curable diseases. In some jurisdictions in LMICs, such as Brazil and South Africa, citizens have utilized socially cohesive groups, the media, and sometimes applied politics to judicialize critical interventions on grounds of human rights (Galvão, 2005; Forman, 2008; Gruskin & Raad, 2010; Forman & Kohler, 2012; Biehl et al., 2016). Locating the right to health within the framework of human rights positions citizens to socially mobilize for governmental intervention on issues of health (Heywood, 2009, p. 16). In Ghana, this seems not

to be the case as citizens are less likely to socially mobilize to make the government prioritize health or a health-related issue such as cervical cancer.

The expression of human rights framework gives concessions for interventions, such as HPV vaccines, as a fundamental human right and has legitimacy in international conventions, such as the Universal Declaration of Human Rights and the International Covenant on Economic, Social and Cultural Rights (ICESCR). This concession can retain a legal status on the grounds of fundamental rights, such as the right to life, and can empower individuals and groups to make meaningful social demands on governments whose actions or inactions deny or limit access to essential life-saving vaccines and the right to health. Even though cervical cancer incidence and mortality are high in Ghana, and despite the possibility of gaining financial support from Gavi to purchase HPV vaccine to vaccinate school-going children, the country has no plans of a vaccination program. Making the HPV vaccine accessible to those who need it at no/minimal cost to them will be a directive of the governmental accountability towards upholding the right to health and consequently the fundamental human right to health with its ideals of enjoyment of quality life. The absence of a program to make HPV vaccines available denotes a lack of political will and thus, becomes fuel for the increasing case numbers of cervical cancer cases in Ghana.

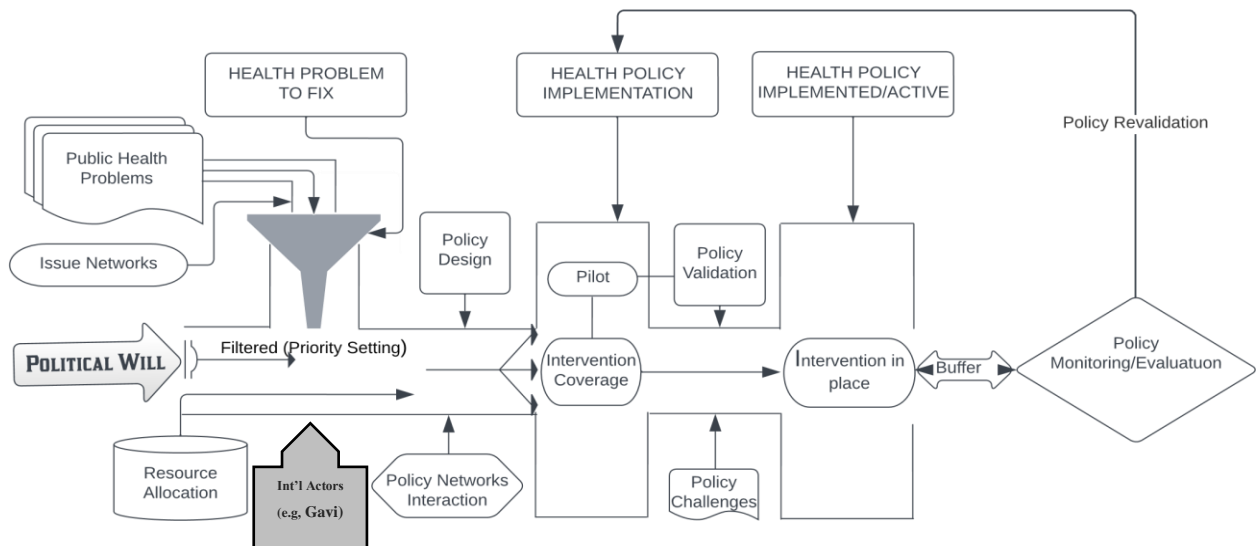
Beside the 1992 Constitution of Ghana which has human rights components, the country is a signatory to many conventions and treaties on human rights at the regional and international level. While this is the case, adherence to stipulations of rights to health have been met with some challenges. For example, Universal Health Coverage (UHC) in Ghana, even though a progressive health initiative, it is faced with myriads of challenges such as human resource, logistics, technical expertise, and financial constraints, which impact on implementation outcomes (Amoah & Phillips, 2018; Rosenquist et al., 2013).

When self-preservation is threatened, individuals, groups or the society at large adjusts to reset the anomalies by making retroactive legal, political, and social demands that improve their lived experience within the space of their fundamental human rights (Gruskin et al., 2007; Forman, 2008; Teubner, 2019). According to Latour, the coherency sustained by society by making demands within the framework of human rights compels actors like governments to learn to “[clean] up their own mess” and eventually provide opportunities for needful solutions (Latour, 1996, p. 376).

### 8.12.7 Proposed approach to health policymaking

To maintain a structured policy framework that can support the lifecycle of a policy intervention, I propose the schematic policymaking framework in Figure 9.

**Figure 9: Schematic flowchart of public health policymaking for intervention**



Source: author developed, 2023

The framework in Figure 9 is developed as a policy tool to position the point at which a specific public health problem is likely to push through the various competing priorities of government for attention. Health problems trickle down the funnel of problems and filtered through the narrow funnel neck for problem stratification and/or discrimination by policy actors.

The policy actors then select what to focus on and push it through for governmental attention where pressure is put on government to provide the necessary resources for intervention. The level of political will provided by government determines the volume of resource allocation for intervention, which eventually drives forward the intervention up to when it becomes actively effective in society. Once the policy intervention becomes active, regular evaluation must be in place to monitor progress and assure intervention consistency or inconsistency, and where necessary, a revalidation of the policy must be executed to maintain policy effectiveness and assure policy state of control.

### **8.13 Conclusion**

Focusing on the behavior of policy actors and the “recursive interactions” within the networks and the evolution of the networks implies paying attention to the interactions taking place and the type of outcome generated from the interactions (Bilodeau & Potvin, 2018, p. 175). According to Bilodeau and Potvin, this opens the “black box” of what intervention/policy is prescribed as it permits “investigation of the production of effects” of the intervention/policy (ibid). The Ghana case study presents diverse nodes of concerns and similarly enlightens areas of concerted actors’ effort to make nationwide HPV vaccination in Ghana a practical approach to prevention and control of cervical cancer feasible. For example, the study shows that only a small number of the study population indicated debuting sex before 17 years. This is consistent with recent HPV and related cancer fact sheets for 2021 for Ghana by the ICO/IARC Information Centre on HPV and Cancer that 9.3% of men and 11.8% of women indicated debuting sex on or before their 15<sup>th</sup> birthday. Whereas this study is limited in the number of responses analysed, it nevertheless supports an assumption that a large section of adolescents do not debut sex before their 15<sup>th</sup> birthday, at the least. This is a strong indication that prioritizing HPV vaccination for

school-going adolescents present a public health opportunity for Ghana. Further studies, however, should be done in this area to delineate what the mean age of sexual debut in Ghana is and the implications for population health.

The study has shown that awareness of HPV, HPV vaccine, and HPV-related cervical cancer is gaining momentum. This outlook is in variance with previous studies that showed low awareness levels. It is expected that awareness levels will gradually increase particularly among the literate populations, as the less literate catchup. This rise in awareness is reassuring as it is likely to cause policy advocates and societal groups to push government to prioritize cervical cancer prevention and control. The popularization of breast cancer prevention in Ghana due to increased awareness creation and stakeholder engagement and how it led to increased governmental priority setting and resource allocation set a good precedent for cervical cancer prevention. From the study, it has been shown that HPV vaccine uptake in Ghana will expectantly be high. The majority of respondents also indicated a high level of confidence in the HPV vaccine and are willing to be vaccinated once the country rolls out a nationwide HPV vaccination program.

From the health intervention reports, draft policies, and health insurance schemes in place, Ghana is not deficient when it comes to policy or program design. A fundamental policy problem that is deduced from this research is that policy implementation in Ghana is inhibited by poor resource allocation and low priority accorded to the prevention of cervical cancer. While the country has some well-written health policies in the sub-Saharan Africa region, these policies are generic and, in most cases, lack disease specificity. For example, the National Strategy for Cancer Control in Ghana presents a blanket policy document that lacks the ability to exhaustively tackle a disease area, like cervical cancer. This makes it very difficult to track any gains made by the policy in its entirety due to this generality. Considering that cervical cancer is the second highest



cancer-causing disease among women in Ghana and noting that most cervical cancers are caused by high-risk HPV, it is expected cervical cancer will gain significant government attention. This study shows otherwise, as Ghana currently has no plans to introduce a nationwide HPV vaccination programme despite the pilot program implemented without the results being released. This situation reflects an absence of political will to act to address preventable chronic disease.

Prioritization of health through efficient resource allocation and maintaining responsibility for ensuring citizens right to health is upheld is paramount in agenda setting for government. The effect is improving the lived experience of citizens. In essence, the interactions between actors and the connections existing among them (sometimes between previously unrelated actors), the alignment of actor interests, and the influence wielded by actors effectuate policy. Improper or bias balancing of any/or all of these can cause policy or policy reform to be inequitable.

### ***8.13.1 Limitations***

Survey responses (obtained from 21 December 2021 to 15 March 2022) from participants and interviews (conducted from 05 January 2022 to 05 April 2022) of selected stakeholders were received within a span of three months. The short duration may have prevented a larger section of the public from getting access to the survey link and completing the survey. The timespan to collect data also may have impacted opportunities to interview more stakeholders. This limitation is compensated for by the mixed data collection approach which complemented the short comings of each other through data triangulation and the use of secondary data from the literature to support the findings.

## 9 HPV vaccine access and cervical cancer policymaking process: A comparative governmental priority setting study of Ghana, Rwanda, and Canada.

### *Case Studies Comparative Analysis*

#### 9.1 Abstract

**Background:** Considerable differences exist in priority setting and resource allocation activities among the states compared. For example, the governments of Canada and Rwanda prioritized cervical cancer prevention and control through resource allocations using different tools and mechanisms for nationwide HPV vaccination of primary and middle school students, particularly girls. Conversely, Ghana has opportunities to mobilize resources and set priorities for cervical cancer prevention; however, these opportunities are not pursued. Ghana has shown that it can design and implement technically competent policy. There exist documents that address HPV infection and cervical cancer prevention and control in Ghana; however, these documents are not effectual as they lack political will for prioritization and required resources for implementation.

**Method:** A comparative analysis comprises case studies of Canada, Rwanda, and Ghana, compared along variables that shape health policy and the policymaking process, including priority settings and resource allocation cross-nationally to identify similarities and differences and areas of policy convergence or divergence.

**Findings:** The incidence and mortality rate of cervical cancer is low in Canada, reducing in Rwanda, and continues to rise in Ghana. Financial commitment from the government, framing and normalizing a public issue to attract the least adversary, effective stakeholder engagement, and resource (obtained locally and through international development aid) allocation significantly influence policy outcomes. Politics, actor interest, and their power in policymaking critically allot political will and action for HPV vaccination and cervical cancer prevention.

**Conclusion:** Deciding to act by implementing a nationwide HPV vaccination in HICs, such as Canada, and LMICs, such as Rwanda, and not acting due to resource constraints, such as in Ghana, has shown that governments can leverage creative approaches to act on a public problem successfully with or without plentiful resources. Effective framing for the public good and politics stimulates priority setting.

**Keywords:** comparative analysis, Ghana, Rwanda, Canada, priority setting, resource allocation, policy, policymaking

## 9.2 Introduction

### 9.2.1 *What is comparative analysis?*

To understand comparative analysis in its most basic form is to understand what analysis is and how comparison of variables independently analyzed brings meaning(s) to a public problem. Analysis involves the application of tools used to explain and understand one or more variables and their interactions within a system to identify implicit or explicit causal relations. The process begins with either intensive or extensive information gathering, which may include qualitative and/or quantitative data gathering; all of which provide opportunities to identify and uncover cause or lead to cause of the fundamental cause. The cause may be the necessary or sufficient trigger to the effects or phenomenon observed and can be precipitative or conditioned by systems to occur. One example is economic systems that may condition governments to take certain necessary or sufficient actions (policies), which produce a particular observed effect or phenomenon. Also, the *cause* of the cause may be structural, whereby the forces determining the action of the cause “cannot be reduced to a single causal variable” (Pickvance, 2001, p. 9), or contingent, where the cause arises dependent of other variables (Bennett & Elman, 2006). To understand data, analysis can be performed to interpret the logic underlying the data observed in representation of any presumed causal relationship to baseline variables or comparator units or concepts. This causal relationship, according to Pickvance, is “always a matter of inference” (Pickvance, 2001, p. 13). While description of the data provides premise to evaluate the values of the variables described, the most important is how these variables relate between and among themselves (Przeworski & Teune, 1966, p. 554). At this juncture, the data is organized for comparative analysis and becomes a prominent evaluation tool. Some have resorted to qualitative comparative analysis, combining qualitative and quantitative data to systematically compare

causal relationships (Ragin, 1998; Roig-Tierno et al., 2017). The application of knowledge produced from comparative studies is to support policy improvements, prevent policy failures, and correct policy misalignments. This is drawn from the lessons gained from the analysis and intelligent observations made that speak into the conclusion drawn. As Rose & Mackenzie pointed out,

“Every country has problems of government and public policy. In an effort to reduce dissatisfaction, policy-makers have three alternatives: to turn to their national past, to speculate about the future, or to seek lessons from current experience in other places” (Rose & Mackenzie, 1991, p. 458).

Pickvance posits that comparative analysis must occur under two conditions: 1) data collection “on two or more cases” and 2) “an attempt to explain the logic of the data rather than only describe [it]” (Pickvance, 2001, p. 11). According to the author, the absence of either condition is simply a juxtaposition and cannot be counted as analysis, thus, he advocates for focus on similarities and difference in variables (ibid). This is where comparison finds value. Comparison within and among nations, and the sociopolitical milieu within which this evaluation occur, dates to Ancient Greece (Miettinen & Nurminen, 1985; Rose & Mackenzie, 1991). Comparison within the social sciences, with its extension to public health, has been used to defend social theories and search for “empirical evidence across time and space” (Rose & Mackenzie, 1991, p. 446). Many reasons may give rise to comparative studies. One is “to examine whether a condition which is given or fixed for one society is influential or not” (Pickvance, 2001, p. 15). According to Rose and Mackenzie, a multinational comparative analysis can employ “concepts”, which may include variables such as class, religion, leadership style, governance, voting, etc., (Rose & Mackenzie, 1991, p. 447). These concepts become the premise for defining the variables necessary for representing nuance or ostentatious categories needed for making the comparative analysis. For example, in comparing Canada to Rwanda or Ghana, the concept of governance

could be applied, and similarities or differences inferred on that basis. Nuanced categories, such as political practices, social policies, healthcare politics, can emerge as a result. According to Rose & Mackenzie, while information on compared countries may be gathered without a guiding conceptual lens, there will be “no basis for relating one country to another” (Rose & Mackenzie, 1991, p. 447). Equally, it is pointed out that comparative analysis assumes *bounded variability*—that is, the immediate noticeability of differences in countries and the ability to demarcate or recognize the boundaries within the differences noticed (ibid). Comparative analysis has been found useful for assessing policy consequences for different political jurisdictions, thus providing lessons for a better policymaking process (Banting & Corbett, 2002, p. 2).

### ***9.2.2 Validity and reliability of cross-national comparative analysis***

Making cross-national comparisons when socio-economic and political dynamics are vastly different requires a cross-sectional approach where concepts and term descriptions can parallel, converge, or mirror each other across the countries. To validate such cross-sectional comparison of countries, Przeworski & Teune suggest the identification of “equivalent indicators” and relating them to “identical indicators” in the different countries (Przeworski & Teune, 1966, p. 551). At some point, the countries become units of analysis whereby their aspects of uniqueness stand out as points of reference in the analysis (Przeworski & Teune, 1966, p. 552). Whereas concepts present reasonable premises to conduct comparative analysis, they may mean different things to different countries, thus, presenting variability as a result of factors, such as political systems, culture, and economics (Przeworski & Teune, 1966, 1974). These variabilities are embedded in empirical measurement rather than the abstract (Bensaou et al., 1999; Davidov et al., 2014; Przeworski & Teune, 1966). For example, to consider health inequality among nations, the empirical question to ask is, whether the tools or parameters used in one country can be unbiasedly

used in another country considering all the variables at play, and how outcomes relate. To answer these questions, the procedure for making such inquiry must possess cross-national validity based on identical properties (Przeworski & Teune, 1966, p. 555). Without identical properties, underlying biases can deflect the true reflection of the analysis outcome, this is never the case (Spivak, 2009, p. 609) because countries operate at levels that are socially, politically, culturally, and economically different. The systemic variables or concepts do not necessarily intersect or may intersect at some point of the analysis and then diverge into peripheral concepts where making any meaningful conclusion will be weak or superfluous. Thus, what happens in one country happens independent of its unique concepts and normative cultures and making a like-for-like assessment will be detrimental to the outcome of a comparative analysis study. Expounding on this, Przeworski & Teune put forward the example of death rate and voting as a marker to assess governmental effectiveness for Ghana and the U.S. The authors assert that while death rate would be a paramount indicator of governmental effectiveness in Ghana, it would not be so for the U.S, rather, voting will (Przeworski & Teune, 1966, p. 552).

It is imperative to know the nodes of differences, at what node(s) countries are similar, why those differences and/or similarities occur and why they do so, and the effects of the differences and/or similarities to public good (Przeworski & Teune, 1966; Rose & Mackenzie, 1991; Pickvance, 2001). It is within these frameworks of concept that critical questions such as ‘why something is the way it is or why it is not?’ can be asked as these questions express the relational connections or disconnections to the units of analysis or concepts. In that essence, it provides the linkage for what is empirically observed and the abstract discussion of sociopolitical systems that define the countries being compared. Also, comparative analysis is fluid in its appropriation and does not necessarily require the units or countries being compared to be identical

except for commensurability (Pickvance, 2001, p. 24). While commensurability remains a relative terminology, its consideration rest within the premise of social significance “along which two [or more] cases can be given values”, and “what values should be attributed to them” (ibid). These attributions can also be done descriptively so that values are “ascribed to a specific unit of observation” (Przeworski & Teune, 1966, p. 554). The process of value attribution allows for a meaningful pattern to be generated (Tuohy, 2012; Cloutier & Ravasi, 2021). One advantage of making cross-national comparison is the context in which hypotheses are made to establish if a specific relationship is true in different nodes of the analysis in the nations themselves as it reduces the possibility of generalizing from a single case (Rose & Mackenzie, 1991). For example, in examining health equity among countries, a survey may be conducted in countries within the same continent to establish concepts such as race, education, nationality status, culture, income, and access to healthcare. These concepts can narrow down leading to the underlying determinant(s) of health inequity in that unit/concept of analysis. For the same phenomenon in different countries, cross-national and nation specific indicators blend together to enhance the validity and reliability of the empirical measurement of the analysis (Przeworski & Teune, 1966, p. 568). Known as “construct equivalence” (Singh, 1995, p. 603), this procedure is necessary for constructive comparison within and across nations (Przeworski & Teune, 1966; Singh, 1995; Davidov et al., 2014). Tuohy noted that,

“the comparative study of health policy is a dance - between explanation and prescription, between inductive and deductive analysis, and between attention to converging elements and attention to the continuing distinctiveness of each nation. As we compare across time and nations - shall we dance?” (Tuohy, 2012, p. 23).

Without concepts, attempts to perform comparative analysis of multiple countries will be inconsistent and can unnecessarily produce unintended bias outcomes.

### **9.3 Study objectives**

Canada, Rwanda, and Ghana are politically democratic nations. Policymaking similarities and dissimilarities exist among them that can become areas of learning for policymaking strategy forming, policy optimization, and/ or policymaking leveraging. Equally, countries have varied political economies, governance, and policy instruments, which are used to engage or disengage the markers of health equity as far as health as a human right is concerned. This objective of the comparative analysis is to provide valuable lessons on how political, economic, and governance factors can shape political will to redefine priority setting and resource allocation to configure/reconfigure the dynamics of a nation's healthcare policymaking process and policy towards the attainment of national HPV vaccination program and the benefit of cervical cancer prevention. This is particularly so in underserved regions where needed measures to address HPV-related cervical cancer morbidity and mortality remain limited.

### **9.4 Study methodology**

A case study is the collection of data and systematic deduction or interpretation to distill contexts, contents, or concepts in phenomenal ways that offer evidence for in-depth understanding (Terrell, 2012; Tetnowski, 2015; Harrison et al., 2017). The cross-national case studies comprising Canada, Rwanda, and Ghana were conducted independently. The three country case studies were compared based on contexts, contents, and concepts deduced from the case studies. Similarities and dissimilarities exist among them that can lead to areas of learning for policymaking strategy formation, policy optimization, and leveraging policymaking. The variables along which the three countries were compared are 1) public health and governance systems, 2) women in politics, 3) priority settings and resource allocation, 4) and policymaking process. A tabulation of policymaking consideration among the countries and situational pointers, and how they impact on



policy decisions, are delineated to establish the areas of similarities and dissimilarities in policy decision making. The outcomes from the three case studies are compared to illuminate on the policymaking markers and drivers for each country and how they explain the current nationwide HPV vaccination policy/status quo for each country.

## **9.5 Study design**

The cross-national comparative analysis is illustrated through tables to support data organization and sorting in “ways that facilitate(s) comparisons and [allow] the noticing of patterns” (Cloutier & Ravasi, 2021, p. 127). Comparison begins from the “logic of a matrix” with names of countries arrayed side by side (Rose & Mackenzie, 1991, p. 453) juxtaposed with concepts and specific variables defined in the analysis (Przeworski & Teune, 1966; Schünemann et al., 2008; Cloutier & Ravasi, 2021). An advantage of using tables is that it aids in quick sensemaking of the data, and relating the study findings in insightfully succinct ways that assures trustworthiness of the data assessed (Eisenhardt, 1989; Cloutier & Ravasi, 2021).

## **9.6 Data collection**

Data from the countries were collected and organized for analysis in commensuration to relevant or most common concepts identified in the respective country specific case study. Various data collection approaches were adopted dependent on available information specific to the countries under the study. Themes were developed from the information collected and assessed.

In the case of Canada, government documents and academic and grey literatures were initially explored. A scoping review was conducted on the nationwide HPV vaccination program with a focus on Ontario to identify publications on priority setting and HPV vaccination program. The following themes emerged from the scoping review: 1) policymaking approach, 2) actor influence in vaccine policymaking, 3) cervical cancer prioritization/women’s health priority

setting, 4) vaccine purchase negotiation, vaccine introduction, and 5) the right to health. The full context of the Canada case is presented in chapter 6.

In the case of Rwanda, government documents, academic and grey literatures, and online newsletters were the sources of information used. While a couple of key informants were contacted, some were unable to participate due to other commitments, while others did not respond after initial interest to participate. One interview with an executive from a women's advocacy group in Kigali was conducted. The following themes emerged from the Rwanda case study: 1) policy network stability, 2) presidential leadership style as soft authoritarianism, 3) local policy frameworks: *Imihigo and Ubudehe*, and 4) role of private partners as policy entrepreneurs. The themes were analyzed to make sense of the policymaking process in Rwanda. The full context of the Rwanda case is presented in chapter 7.

In the case of Ghana, government documents, academic and grey literatures, interviews, and an online survey were conducted as part of the information gathering process. The following themes emerged from the data collection: 1) vaccination success predictors, 2) awareness of HPV, 3) priority settings and resource allocation, and 4) the right to health. The full context of the Ghana case is presented in chapter 8.

## **9.7 Emerging concepts, contents, and context**

### **9.7.1 Country context**

While Canada is a HIC, Rwanda and Ghana are categorized as LMICs and qualify for Gavi support for life-saving vaccines, such as HPV vaccines. In Canada, about 1.3% of all new female cancer cases have been attributed to cervical cancer (Public Health Agency of Canada, 2017). The HPV Information Center estimated around 1,422 cervical cancer cases in Canada in 2020 and 637 deaths (Bruni et al., 2023a, pp. iv–5). Within the OECD nations, Canada was among the first countries that introduced HPV vaccination programs in 2007.

In Rwanda, cervical cancer is the 2<sup>nd</sup> leading cause of female cancer and the 1<sup>st</sup> most common female cancer in women aged 15 to 44years (Bruni et al., 2019, 2023). About 1,229 cervical cancer cases and 829 deaths were estimated in Rwanda in 2020 (Bruni et al., 2023b, pp. iv–15). In 2011, Rwanda became the first African nation to introduce a nation-wide HPV vaccination program.

In Ghana, over 8 million women from the ages of 15 years and above are estimated to be at risk of cervical cancer (IARC, 2018, p. 1). According to the HPV Information Center report for Ghana, it was estimated that in 2020, about 2,797 cases of cervical cancer were reported and 1,699 deaths ( Bruni et al., 2023, pp. iv–16).

**Table 16: Cervical cancer prevalence per 100,000 women (2020)<sup>19</sup>**

	women at risk of cervical cancer			Incidence	age-standardized incidence rate per 100,000	Mortality	age-standardized mortality rate per 100,000 women	most common female cancer in women aged 15 to 44 years
	Female population	Female over the age of 14 years at risk	Estimated percentage of female over 14 years at risk					
<b>Canada</b>	19,136,824 <sup>20</sup>	16,300,000	85.2%	1,422	5.53	637	1.93	4 <sup>th</sup>
<b>Rwanda</b>	6,723,217 <sup>21</sup>	4,350,000	64.7%	1,229	28.2	829	20.1	1 <sup>st</sup>
<b>Ghana</b>	14,814,792 <sup>22</sup>	10,600,000	71.6%	2,797	27.4	1,699	17.8	2 <sup>nd</sup>
<b>World</b>	3,890,000,000 <sup>23</sup>	2,972,760,000	76.4%	604,127	13.3	341,831	7.25	2 <sup>nd</sup>

<sup>19</sup> Dataset obtained from <https://hpvcentre.net/datastatistics.php> on 06/11/2023

<sup>20</sup> Source: <https://data.worldbank.org/indicator/SP.POP.TOTL.FE.IN?locations=CA> accessed on 06/14/2023

<sup>21</sup> <https://data.worldbank.org/indicator/SP.POP.TOTL.FE.IN?locations=RW> accessed on 06/14/2023

<sup>22</sup> <https://data.worldbank.org/indicator/SP.POP.TOTL.FE.IN?locations=GH> accessed on 06/14/2023

<sup>23</sup> <https://data.worldbank.org/indicator/SP.POP.TOTL.FE.IN?locations=1W> accessed on 06/14/2023

The mortality rate of cervical cancer is relatively lower in Canada. While the mortality rates in Rwanda and Ghana are relatively higher, Rwanda has a nationwide HPV vaccination program akin to Canada and other OECD nations that promises to reduce case incidence. In 2013, the Ministry of Health in Ghana conducted an HPV vaccination demonstration pilot in four districts but has not progressed to introduce the HPV vaccine nation-wide.

The question of priority setting and resource allocation within the realm of governance (political will) is addressed to clarify why some countries (in HIC-Canada, and LMIC-Rwanda) succeed and others do not (LMIC-Ghana) to implement a nationwide HPV vaccination program.

### ***9.7.2 Public health policy and governance systems***

Health policy may not involve or recognize a government or its agency as a central actor. On the other hand, public health policy is government centered and “intersects policy that is health related but impacts the general population” (Porche, 2017, p. 5). Public health without policies is meaningless. It shows that countries will not achieve any meaningful public health outcomes “unless the necessary legal and regulatory tools have been developed and implemented” (Njuguna et al., 2020, p. 2).

Rosenau and colleagues discursively describe governance as “a system of rule that works only if it is accepted by the majority (or, at least, by the most powerful of those it affects)” (Rosenau et al., 1992, p. 4). That is, governance sets the rules of engagement and seeks to possess legitimacy to function in a particular way for specific outcomes that are generally accepted by a majority of actors (Rosenau et al., 1992; Bexell, 2014; Harman, 2016). This, however, presents challenging public governance paths to navigate due to the complex policymaking environment that decision makers go through to arrive at a public policy that solves a public problem (Dye, 1992; Dunn, 2015; Kraft & Furlong, 2019). The complexity of public policymaking has been

attributed to the sometimes difficult interactions among the different policy actors and the different interest of these actors that manifest during policymaking process (Hunter, 2015; Kickbusch et al., 2016). This diversity of actors and their interests drive the required shift or change in a public policy. Public policy thus become a tool for public governance. To understand public governance is to appreciate the politics that underlie its functions. Governance defines leadership, stewardship, accountability, responsible management, policy oversight, and the ability to effectively prioritize and mobilize resources for public good (Mikkelsen-Lopez et al., 2011; Van Olmen et al., 2012; Barbazza & Tello, 2014). According to Gable, health governance assembles the tools and mechanisms needed to manage the factors influencing health outcomes (Gable, 2007, p. 534). It sets the rules of engagement and provides the structures for health policy to function in a particular way for specific outcomes (Bexell, 2014; Harman, 2016; Rosenau et al., 1992). Health governance thus expresses how health and healthcare systems of a country are structured or organized through leadership and policy with the objective of improving the health of the population. It also expresses “structures and processes by which health system is regulated, directed and controlled” (Dwyer & Eager, 2009, p. 1). According to the WHO, in public health governance, the State, health service providers, and citizens are the three critical stakeholders who routinely engage with each other to determine how a nation’s “health system and its governance” are structured (WHO, 2022). One area of health governance common to the three countries under this study is national health insurance, as all three countries have at least one form of national health insurance.

In Canada, while the federal government makes funds available for healthcare, the provinces/territories take on the role of ensuring healthcare delivery by exercising leadership and being accountable for health promotion initiatives such as population immunization. The Canadian healthcare system, under the Canada Health Act 1984, is financed by the provinces/territories

insurance plans. The Act allows healthcare access based on need and not on the ability to pay. The public health governance system is managed concurrently by both the federal and provincial/territorial governments.

In Rwanda, despite the genocide in 1994, which led to a distressed economy and healthcare systems, Rwanda has risen to become a beacon of hope to most LMICs, particularly in Africa. This is especially so in public health policy and policymaking strategies. For example, Binagwaho and colleagues note that, in Rwanda, participatory policymaking “has enabled swift implementation of new programmes” (Binagwaho et al., 2014, p. 372). Traditionally, Rwanda has self-managed governance systems, such as *Ubudehe* and *Imihigo*. *Ubudehe* signifies the practice of collective action and mutual support to solve problems within a community. On the other hand, *Imihigo* is an informalized pledge taken by community leaders to ensure that government-initiated projects are responsibly executed. Even though these social systems support effective policymaking in Rwanda, the leadership style of the incumbent government has been criticized as soft authoritarian. With soft authoritarianism, the incumbent government is speculated to implicitly discourage opposing voices to its policies and agendas. This has led to some referring to the incumbent as running a one-party state government (Hagmann & Reyntjens, 2016; Chemouni, 2018; Desrosiers, 2020; Bisoka & Geens, 2021). Whereas the incumbent government in Rwanda is perceived to be practising soft authoritarianism, the government has increased its capacity and experience in mobilizing internal and external resources and harnessed these resources effectively for public good.

Ghana is one of the first countries in sub-Saharan Africa to gain independence. The political landscape has been fraught with sporadic coup d'états leading to mistrust among opposing political parties. This mistrust rarely promotes participatory governance and public policymaking.

Ghana is a democratic nation that practices the Westminster system of government with elected parliamentarians. While that is the case, the country is sometimes spoken of as practising a “Winner-takes-All” (WTA) politics (Gyampo, 2015, 2016; Ijon, 2018). The practice of WTA disproportionately marginalizes opposition parties and individuals or groups who are not associated with the incumbent government or express different viewpoints other than that of the government. According to Gyampo, WTA characterizes divisiveness within the politics of the country and reduces opportunities for alternative policy ideas (Gyampo, 2016, p. 2).

In its fundamental outcomes, WTA promises rewarding outcomes to incumbent governments and directly penalizes, marginalizes, expands inequality, and promotes despondency among sections of the population. Even though the practice of WTA is lucrative to incumbent governments and may serve as mistrust blockade against opposition party infiltration in governance, WTA impedes national development as it prevents new ideas and opportunities from infiltrating the closely knit incumbency governance control. Even though Ghana has embraced democratic governance, the absence of inclusivity in its governance approach can put social policies that are not in the interest of an incumbent government in a state of policy inertia. At the policy inertia stage, public policy that is prioritised or has not received governmental support is quickly sidelined or receives sluggish incumbent attention; hence, remains only as a “policy” with no action plan. Subsequent governments that come into power are not incentivized or obligated to pursue previous government’s policies that are in inertia, thus, it will find subtle ways to sabotage, continue to keep those policies in inertia, or completely end the lifecycle of those policies engineered by the previous government (Agyepong & Adjei, 2008; Alatinga, 2011; Isioma & Ewald, 2012). For example, in 2000, the New Patriotic Party (NPP) campaigned on ending the then incumbent National Democracy Congress (NDC) party’s Cash-and-Carry health policy in



Ghana for a National Health Insurance Scheme (NHIS) in 2001 (Agyepong & Adjei, 2008; Alhassan et al., 2016; Kusi-Ampofo et al., 2015). While the NPP successfully scrapped the Cash-and-Carry system for the NHIS, it struggled with a range of technical challenges that were related to “politics of social policy reforms” (Agyepong & Adjei, 2008, p. 152). The politics of social policy reforms are areas that the NDC have experience with and could make significant policy inputs were they consulted by the NPP, or were they allowed to participate in the policy reform process of the Cash-and-Carry to the NHIS (Carbone, 2011; Grebe, 2015).

For inclusive governance, the chieftaincy institution (an apolitical traditional leadership institution) is recommended by the 1992 Constitution to serve as a buffer for political trust building and as policymaking stakeholders. According to the Ghana 2008 Chieftaincy Act 759, a chief is an elected/selected and enstooled/enskinned/installed person in alignment with the prevailing customary laws to lead a group within a jurisdiction (*The Chieftaincy Act, 2008 (ACT 759)*, 2008). Chieftaincy as a leadership system in Ghana dates back pre-colonial era and is recognized as institutional custodian of Ghanaian socio-cultural heritage (Owusu-Mensah, 2014, p. 262). This is due to the ability of the chieftaincy system to customarily make laws and regulations for social order that assure public health and safety of the people.

### ***9.7.3 Women in politics: A catalyst for policymaking success***

Marginalization of women in politics is not uncommon in HICs and LMICs, however, is rife in LMICs. As noted by Ndinga, even after decades of independence from colonial rule, “women continue to face more obstacles” in their quest to enter into politics as policymakers (Ndinga, 2019, p. 171). Some reasons for these obstacles are attributed to the paternalistic decision-making processes society has inherited from cultural constructs and beliefs.

Despite challenges of women taking on leadership roles in governance, Canada and Rwanda have seen substantial presence of women in political leadership. The presence of women's leadership in these countries creates fair policy environments for women's issues to receive traction during governmental agenda settings due to balanced representation of women in the decision-making process on matters that affect them. For example, while it is noted that men continue to dominate in the political landscape in Canada, women's leadership is popularising and making "gains in [political] party organizations", such as receiving nominations (O'Neill & Stewart, 2009, p. 737). Canada remains one of the OECD nations with fair representation of women in government, and in some instances, women lead political parties.

The presence of women in government is even more pronounced in Rwanda. Due to the past history of genocide in Rwanda, to build capacity and foster unity among the diverse groups in the country, the Constitution of the country embraces an all-inclusive government with equitable presence of women in government leadership (Newbury & Baldwin, 2000; Cohen et al., 2005; Burnet, 2008; Ndinga, 2019). The 2003 Rwanda Constitution stipulates that a minimum of 30% of women must be part of the composition of all government decision making bodies (Bauer & Burnet, 2013, p. 105). For example, nine years post genocide, Rwanda started with 39 (48.8%) women out of 80-member chamber of Deputies, who were all elected through a tiered electoral process (Burnet, 2008, p. 361). Currently, Rwanda is the first country in the world to have more female in parliament with 61.4% in the chamber of deputies (Women Representation, 2022). The large presence of women in Rwanda's governing politics has been lauded as a preamble to a peaceful and more equitable political landscape post genocide (Longman, 2006; Burnet, 2008; Debusscher & Ansoms, 2013). This is symbolic of the democratization process in the rebuilding and reconstruction of post genocide Rwanda (Burnet, 2008, p. 363).

The case in Ghana is quite different. While there are 275 parliamentary seats in Ghana's Westminster style governing system occupied by elected parliamentarians; only a handful are represented by women. For example, between 2011 (8.3%) to 2021 (14.5%), there has been only a 6.2% rise in women parliamentarians in Ghana (Statista, 2022). It is interesting to note that the 1992 Constitution of Ghana indicates non-discrimination in governance, and it does promote women's inclusivity in policymaking and governance. However, this is not reflective in the number of women political leadership roles or represented in critical public policymaking. The influence of women in politics and policymaking is not only symbolic of democratic inclusivity, diversity, gender equity, and human rights ideals. Women in leadership positions directly/indirectly introduce new realms of ideas into governances and policymaking spaces traditionally dominated by men and allows gendered issues to be prioritized and resources equitably allocated for action.

#### ***9.7.4 Priority settings and resource allocation***

Priority setting is a political act of decision-making that revolves around socioeconomic value propositions and varying interests. Within the public health space, it occurs at the macro-level (national, provincial), meso-level (regional, institutional), and micro-level (clinical programs) (Kapiriri et al., 2007, p. 79). While this is the case, priority setting remains almost "ad hoc" especially in LMICs and can occur with minimal transparency in decision making processes leading to suboptimal outcomes (Baltussen & Niessen, 2006; Kapiriri et al., 2007; Tromp et al., 2015; Baltussen et al., 2016). For example, priority setting in some African countries has been noted to happen impulsively without structured planning, thus, lacking evidence-base decision-making methodology (Kapiriri et al., 2007, p. 79). Priority setting can also be deemed the allocation of resources between competing demands. In LMICs and HICs, healthcare resource

allocation is challenged due to insufficient resources and competing interest for governmental attention and prioritization. This resource challenge greatly impedes critical social interventions such as vaccination.

In Canada, priority setting is decentralized at the provincial and territorial levels with different approaches and strategies that are jurisdictionally beneficial. According to Kaporiri and colleagues, the Canadian healthcare priority setting interface at different contexts in a “complex web” occurs because of the different approaches used by the provinces and territories to set health priorities (Kaporiri et al., 2007, p. 79). In Ontario, for example, the government was clear on prioritizing HPV vaccine for women at a younger age because it wanted to prevent the spread of HPV and save lives. It is not surprising that these different approaches of priority setting in Canada play a role in the different health outcomes in the jurisdictions. This is reflective in the different timelines for HPV vaccination rollout and coverage rates among the provinces and territories. It shows that how a government prioritizes its public health or public problem and allocates resources will reflect in its overall health outlook and ultimately reflect in the health outcomes of its citizens.

In Rwanda, the healthcare system post genocide had to be rebuilt almost from beginning, as the civil war which saw nearly one million people dead, devastated the healthcare system. To fix the health system, the government prioritized health as a human capital sustainability strategy by partnering with development partners such as Gavi, Global Fund, and NGOs (Binagwaho et al., 2014). The proactive approach addressing public health issues has created opportunities for Rwanda to continue receiving international assistance towards the rebuilding of its healthcare (Holmes, 2010; Binagwaho et al., 2012; Kramer, 2021). Agnes Binagwaho, a former Minister of Health in Rwanda, noted that even though Rwanda does not currently have the capacity to be

where it wants to be, it makes use of every opportunity like Gavi, and for every resource that it receives, the country “really knows where to put it immediately to make the difference” (Holmes, 2010, p. 945). Rwanda’s attitude to foreign aid for health is a key indicator for success and defines the government priority setting for health promotion (Holmes, 2010, p. 945).

Ghana has a decentralized government system whereby local governments take ownership of governance within their jurisdiction and become accountable to the central government for performance. While decentralization is touted within the political landscape as a way of diffusing power and allowing local governments to take ownerships of governance and make some policy decisions, the central government finds ways to obstruct the process. This is done through structural obstacles such as administrative, legal, and fiscal constraints (Crawford, 2009, p. 57). Such obstruction undermines priority setting at the local level that can cascade into the central government agenda-setting table. Priority setting thrives on politics and the political outlook of a public problem and the inclination of incumbent government to act/not to act shapes the political will needed for resource allocation. For example, while a demonstration off HPV vaccination occurred in 2013 under the NDC party, since 2016 when the NPP party came into power, no evidence exists of this being in political agenda setting for policy attention. Resource allocation for health in Ghana is relatively small compared to other sub-Saharan African countries (Asante et al., 2006; Asante & Zwi, 2009) . This is due to competing government budgetary allocation and economic interest (Asante et al., 2006; Asante & Zwi, 2009; Atuilik et al., 2019; Ayandipo et al., 2020). It is reported by the Ministry of Health in Ghana that, “government budgetary allocation still lags behind the agreed Abuja target of 15% of national spending on health” (MOH, 2017, p. 22). It is, however, important to mention that Ghana shows significant opportunities to succeed should it implement a nationwide HPV vaccination program. Besides willingness to vaccinate, it

is estimated that many school going girls under the age of 17 years have not debuted sex. This is an important window of opportunity to explore as HPV vaccines are prophylactically more potent prior to debuting sex. Rather than framing cervical cancer as a sexually transmitted diseases, it should be framed as a public health issue to garner needed actor traction for political action. For example, Thompson and Polzer note that Ontario’s HPV vaccination program was framed as a cervical cancer vaccine, as a way of establishing “a perception of a public health crisis” (2012, p. 104).

#### ***9.7.5 Policymaking Process: HPV vaccine acceptability and funding***

Vaccine policymaking processes occur in a rather unidirectional and multifaced way with diverse actors who have different interests, political powers, and resources that can be used to manipulate the policymaking process.

In Canada, the federal government is the central actor for vaccine policy, technically leads priority setting, and mobilizes resources for allocation. In nationwide HPV vaccination program in Canada, the policymaking process was significantly influenced by a federal fund of \$300 million, of which the province of Ontario received \$39 million for implementation. Uncommon in policymaking processes in Canada, the HPV vaccination program occurred within a short period (only 7-month) from the time Merck, the vaccine manufacturer submitted the vaccine, Gardasil<sup>®</sup>, to Health Canada for market authorization. While Canada traditionally takes on a much lengthier policymaking process that exhaustively looks at risk-based evidence pertinent to public good, the acceptability of Gardasil<sup>®</sup> for national HPV vaccination program was based on sensemaking. Information on the vaccine was supplied by the vaccine manufacturer, Merck (Navaneelan, 2012; Health Canada, 2021). The Ontario Standing Committee on Finance and Economic Affairs assessed the cost of the vaccine to the province and- as it needed directives from CIC prior to

developing a program-was initially opposed to the vaccination program (Navaneelan, 2012, p. 49). However, with the allocated \$39 million to implement the province-wide HPV vaccination, the province quickly progressed to develop a plan with little resistance from policymaking stakeholders. The ready information on Gardasil® provided by the vaccine manufacturer served as a tool for policymakers to evaluate the vaccine and its acceptability and inclusion for the public immunization programme. Thus, a sensemaking policymaking approach was adopted in making this decision. Sensemaking is the process of group or individual engagement that leads to the interpretation, isolation of meaning, and the creation or recreation of pathways to reflect on problems (Weick et al., 2005; Brown et al., 2008; Rom & Eyal, 2019). Rom and Eyal described it as a time-space “context-laden” situation where a gap is created as a result of the situation and through a process of gap-bridging seek plausible “inputs” through various activities within the time-space (Rom & Eyal, 2019, p. 2). This gap-bridging rests on rational information that presents meaningful understanding and pathways for action(s) to be taken (Weick et al., 2005; Rom & Eyal, 2019). Sensemaking, however, can introduce bias in the policymaking process because of a lack of policymaking robustness and rigour. This can lead to making policy decisions on emotions, which can fail. For this reason, a policy choice stability check is hypothesized to assure that decisions made for a chosen policy can be robust. Applying the hypothesis, the Canada nationwide HPV vaccination policymaking process is estimated to be robust based on the policy choice stability check outcome.

In Rwanda, the country explored a window of opportunity that was opened by the vaccine manufacturer, Merck, to support LMICs that wanted to initiate a nationwide HPV vaccination program. Rwanda capitalized on this opportunity, utilizing its local frameworks, such as *Ubudehe* and *Imihigo*, and bringing all relevant stakeholders together for policy action. The coming together

of policy actors generally will include the government, society, and corporations. The intersection of these three realms does not always produce policy equity, however, as in most cases, government and corporations tend to bind tightly together in the policymaking process (Buse et al., 2012; Prithwiraj & Tarun, 2012; Moon, 2019; Zhang, 2021). Even though Merck did not visibly become a policymaking actor in the Canadian case, Merck was a visible critical policymaking actor in the Rwanda case. The presence of Merck in Rwanda's national HPV vaccination program policymaking is instructive of the role of the vaccine manufacturer in shaping the policy and its outcomes. While the role of Merck was criticized as not being in the best interest of the Rwandan people (Ouedraogo et al., 2011, pp. 315–316), the success of the program in Rwanda is suggestive that the input from vaccine manufacturer in the policymaking process shaped the policy outcome (Binagwaho et al., 2014, p. 372).

In Ghana, there is no premise to navigate a nationwide HPV vaccination policy. While that is the case, the country has a track record of making good policy documents. This can be indicative that the country has technical expertise in putting policy documents together. Policy implementation action items in Ghana, especially for health promotion, face a range of execution challenges that lead to policy inertia. As noted by a key informant for the Ghana case study,

“...we have all the good policies, like the cancer control policy in 2010, excellent policy! The problem is implementing it. And it has always been put on the lack of funds. So, I wouldn't say we lack the policies. For the policies we have about the best you can think about. We have a very good cancer control policy for over a decade, but they've not been implemented. We know who to screen, we know who to vaccinate. They are all in the policy, but it has never been implemented because we blame it on the lack of funds. So, I wouldn't say that we don't have the capacity to make the policy. The problem is the implementation; that has been a problem”<sup>24</sup>.

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<sup>24</sup> A response from GH-001-PHY, one of the forerunners of cervical cancer prevention and control in Ghana.



Taking the NHIS for example, while this policy was highly touted, it faced numerous implementation issues, such as lack of financial sustainability, poor control systems for accountability, and ineffective management of the Scheme among other considerations (Agyepong & Adjei, 2008; Gajate-Garrido & Owusua, 2013; Fusheini, 2016; Fusheini & Marnoch, 2020). Drafting a policy alone is not enough. A sustainable implementation strategy, resources for execution, and an accountable framework for the performance of the policy is critical to policy success.

### **9.8 Policymaking considerations among the countries**

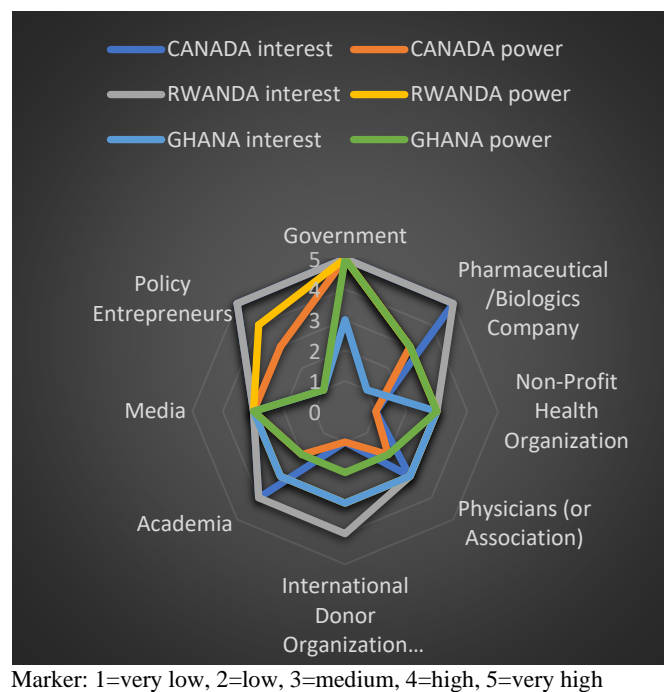
Table 17 delineates the considerations and prevailing policy conditions in Canada, Rwanda, and Ghana, as either explicitly or implicitly presented in the respective case studies. These are estimations based on literature, interviews, questionnaires, case study outcomes, and assessments of the case studies, thus are subject to further research. However, the tabular presentation shows how the variables, concepts, contexts, and contents from the cases in Canada, Rwanda, and Ghana are similar or different.

**Table 17: Policymaking considerations factors**

<b>Variables</b>	<b>Consideration</b>	<b>Canada</b>	<b>Rwanda</b>	<b>Ghana</b>
<b>Vaccine Acceptability</b>	Government	High	High	Moderate
	General public	Moderate	High	High
<b>Policymaking Approach</b>	Use of evidence in policymaking	Yes	Yes	Yes
	Nature of State-Societal relations (e.g., corporatism or pluralism)	Pluralism	Authoritarianism	Pluralism
	Policy instruments available	Yes	Yes	Yes
<b>Policymaking actors</b>	Government	Yes	Yes	Yes
	Pharmaceutical/Biologics company	Yes	Yes	No
	Non-profit health organization	Yes	Yes	No
	Physicians (or association)	Yes	Yes	Yes
	International donor organization (e.g., Gavi)	No	Yes	Yes
	Academia	Yes	Yes	No
	Media	Yes (Policy debate)	Yes (Program awareness)	Yes (Disease advocacy)
<b>Vaccine Negotiation Strategy</b>	Policy entrepreneurs	Yes	Yes	No
	Government negotiates with vaccine manufacturer	Yes	Yes	No evidence
	Government negotiates with other stakeholders (Besides vaccine manufacturer)	No	Yes	No evidence
<b>Vaccine Funding</b>	Government negotiates with Gavi	No	Yes	No (No information)
	Vaccine purchasing policy available	Yes	Yes	Yes
	Government funding	Yes	Yes	Yes
	Gavi funding	No	Yes	Yes
	Pharmaceutical company funding	No	Yes	No
<b>Mass Media and Education on HPV</b>	Other stakeholder group funding	No	Yes	No
	Government media station	Yes	Yes	Yes
	Private media stations	Yes	Yes	Yes
	TV station education	Yes	Yes	Yes
	Radio station education	Yes	Yes	Yes
	Social media	Yes	Yes	Yes
<b>Government Health Priority Setting</b>	School education program	Yes	Yes	Yes (Sporadic)
	General population vaccination	High	High	Medium
	HPV vaccination	High	High	Low
	Women's health	High	High	Medium
	Consideration of health as a human right	High	High	Low
Governmental accountability for health	High	High	low	

A chart of HPV policymaking actor interest and power/influence estimation based on actor engagement in HPV vaccination and cervical cancer prevention (see appendix 9), shows that while power among actors (selected for this estimation) is nearly even, interest significantly differs. For example, interest level among policy actors in Rwanda is conspicuously high compared to Canada and Ghana. Generally, actor-interest triggers political will and sparks collective action. In Canada, for example, prior to the federal government making a financial commitment to fund the HPV vaccination program, interest was low among the provinces/ territories, as in the case of Ontario. However, interest peaked when provinces/territories were relieved from the full financial cost of the vaccination program. In Ghana, it is likely the interest level among actors is shaped by resource constraints, a lack of commitment to allocate resources, or possible actor dependency or disinterest.

**Figure 10: Radar chart of actor interest and allocation of power in HPV policymaking**



Whereas power allocated to actors can be used to direct or redirect the policy outcome in the policymaking process, concerted interest by actors on the same public problem triggers a high level of political will for action. This opens opportunities for alternative solutions and thus creates new pathways for resource mobilization – as in the case of Rwanda- where external aid and technical expertise were sought for nationwide HPV vaccination program design and deployment.

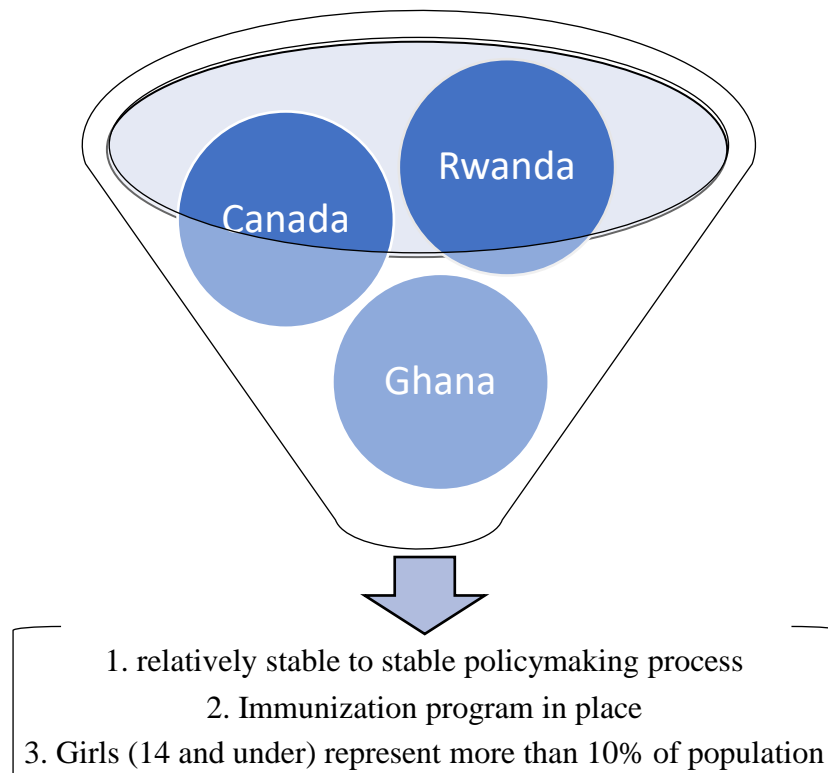
## 9.9 Situational pointers

Situational indicators for Canada, Rwanda, and Ghana, and how they affect the way policymakers act or choose not to act to make HPV vaccines accessible to citizens, is captured in Table 18 below.

**Table 18: Situational Indicators**

Canada	Rwanda	Ghana
Relatively stable policymaking process	Stable policymaking process	Stable policymaking process
Sufficient funding	Lack of funds	Lack of funds
Immunization program in place	Immunization program in place	Immunization program in place
Resource rich	Resource constraint	Resource constraint
Cohesive multi stakeholder engagement	Cohesive multi stakeholder engagement	Loose stakeholder engagement
High awareness of cervical cancer	Medium-to-high awareness of cervical cancer	Increasing awareness of cervical cancer
Not Gavi supported	Gavi supported	Gavi support available
Girls (14 years under) represent approximately 16% of the population	Girls (14 years under) represent approximately 14% of the population	Girls (14 years under) represent approximately 11% of the population
Adequate resource allocation for health	Moderate resource allocation for health	Inadequate resource allocation for health
Low-to-high political will	High political will	Low-to-no political will
High health priority setting	High health priority setting	Medium-to-low health priority setting
No evidence of use of AID	Explore/ effective use of donor AID	No evidence of exploring or use of donor AID
\$300 million HPV Immunization Trust from Federal government	2 million doses of Gardasil donated by Merck	
Indirect engagement of vaccine manufacturer (Merck)	Direct engagement of vaccine manufacturer (Merck)	
Provinces and Territories have HPV vaccination programs (varied coverage rates)	National HPV vaccination program (over 90% coverage)	

**Figure 11: Funnel Outcome**



All three countries have immunization programs in place, with a precedent to begin a vaccine rollout program. Given dissimilar economic outlooks, Rwanda and Ghana can attain support from Gavi to purchase the vaccine as LMICs. As a HIC, Canada is ineligible for assistance from Gavi, and thus purchases the vaccine directly from the manufacturer. The political decision by the Canadian federal government to allocate \$300 million towards the national HPV vaccination program, in the case of Rwanda Merck's donation of 2 million doses of Gardasil vaccine, and Gavi support to continue the supply of the vaccine to Rwanda heightened interest and sustained the HPV vaccination program and cervical cancer prevention.

### **9.10 Summary of case studies (Canada, Rwanda, Ghana)**

In Table 19, the three country cases are characterized according to: 1) priority setting, 2) governance, 3) constraints, 4) windows of opportunity, 5) success factors, and 6) outcomes. These

factors outline the policy parameters and how the respective countries used resources (internally and/or externally) to define HPV vaccination programs, or otherwise. In Table 20 the policy governance and political will framework considered are summarized.

**Table 19: HPV policymaking drivers and outcome**

	Priority Setting	Governance	Constraints	Windows of Opportunity	Success Drivers	Outcome
<b>Canada</b>	<ul style="list-style-type: none"> <li>▪ Very high priority setting: Federal government invested \$300 million in Nationwide vaccination program</li> </ul>	<ul style="list-style-type: none"> <li>▪ High political will</li> <li>▪ Program spearheaded by the Prime Minister</li> <li>▪ In the case of Ontario, by the Premier</li> </ul>	<ul style="list-style-type: none"> <li>▪ Policy adversaries who were against the quick policy implementation</li> <li>▪ some provinces had challenges allocating resource on their own</li> </ul>	<ul style="list-style-type: none"> <li>▪ Federal government announcement of \$300 million for the nationwide HPV vaccination for school girls</li> <li>▪ Excellent record of universal immunization for citizens</li> <li>▪ Background participation of Merck</li> </ul>	<ul style="list-style-type: none"> <li>▪ Federal financial resource allocation as an incentive to provincial health systems</li> <li>▪ Structured and quick policymaking process</li> <li>▪ Stable national governance</li> </ul>	<ul style="list-style-type: none"> <li>▪ National HPV vaccination program</li> <li>▪ Over 70% HPV vaccination coverage nationwide on average</li> <li>▪ Reduction in HPV-related cervical cancer cases</li> </ul>
<b>Rwanda</b>	<ul style="list-style-type: none"> <li>▪ Very high priority setting to tackle non-communicable diseases in a systematic way</li> <li>▪ Merck donated 2-million doses of Gardasil® HPV vaccine to be administered to school-going adolescent girls for three years</li> </ul>	<ul style="list-style-type: none"> <li>▪ High political will</li> <li>▪ Program spearheaded by the President's wife (Jeannette Kagame)</li> </ul>	<ul style="list-style-type: none"> <li>▪ International detractors</li> <li>▪ Resource allocation</li> <li>▪ Other competing health priorities</li> <li>▪ Challenges in dealing with multiple stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>▪ HPV vaccine's efficacy</li> <li>▪ Merck's experience in private-public partnership in vaccine program development</li> <li>▪ Gavi continuity support system</li> <li>▪ 98% of Rwandan girls attend primary school</li> <li>▪ International Aid</li> </ul>	<ul style="list-style-type: none"> <li>▪ Leadership style of government</li> <li>▪ Effective diplomatic negotiation</li> <li>▪ Efficient use of Gavi and Merck aid</li> <li>▪ History of good universal vaccination coverage</li> <li>▪ Positive attitude towards foreign aid</li> <li>▪ Public sensitization</li> <li>▪ Ownership of government-led programs</li> <li>▪ Culture of performance evaluation and accountability (<i>Imihigo</i>)</li> <li>▪ Relatively stable national governance</li> </ul>	<ul style="list-style-type: none"> <li>▪ National HPV vaccination program</li> <li>▪ Over 90% HPV vaccination coverage nationwide</li> <li>▪ Incremental reduction in cervical cancer cases</li> </ul>

	Priority setting	Governance	Constraints	Windows of Opportunity	Success Drivers	Outcome
<b>Ghana</b>	<ul style="list-style-type: none"> <li>▪ Low priority setting</li> <li>▪ Cervical cancer prevention strategy embedded in blanket National Cancer Control Policy</li> <li>▪ After HPV vaccination demonstration sponsored by Gavi in 2013 in 4 out of 16 districts, pilot results remain unknown, nothing has happened since then</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low political will</li> </ul>	<ul style="list-style-type: none"> <li>▪ Resource allocation</li> <li>▪ Other competing health priorities</li> <li>▪ Lack of funding</li> <li>▪ Poor program implementation tracking</li> <li>▪ Poor policy throttle for action</li> </ul>	<ul style="list-style-type: none"> <li>▪ High number of adolescents under 17 are estimated not to have debuted sex</li> <li>▪ Public willingness to accept vaccine</li> <li>▪ Gavi support available</li> <li>▪ Opportunity to explore partnership/negotiation with Merck and other vaccine manufacturers</li> </ul>	<ul style="list-style-type: none"> <li>▪ Historically, good at policy document draft</li> <li>▪ Relatively stable national governance</li> </ul>	<ul style="list-style-type: none"> <li>▪ No national HPV vaccination program</li> <li>▪ Rising cases HPV-related cervical cancer morbidity and mortality</li> </ul>

**Table 20: Governance and political framework**

Variables	Canada	Rwanda	Ghana
Institutional Power	Fragmented	Centralized	Centralized
Process	Open	Closed	Closed
Resources	High	Low	Low
Approach to policy development	Consultation	Soft Authoritarian	Winner-Take-All
Policy Entrepreneurs	Yes	Yes	No
Competing priorities for other infectious diseases	Low	High	High
Stigma associated with cervical cancer	No	No	Yes
Women's representation as elected legislative members	Moderate	High	Low



## 9.11 Way forward

Rwanda set out to redefine its healthcare systems and population health after the 1994 genocide. Clear evidence of this is found in its nationwide HPV vaccination program. Many factors emerge to make the Rwandan case uniquely successful. For example, taking advantage of the opportunity to partner with Merck, making prudent use of aid, leveraging support from Gavi, and the communal responsibility to make government programs succeed can be considered factors that promoted the success of Rwanda's case. Even though Rwanda is a resource-constrained country with challenging economic and other competing priorities for other infectious diseases like HIV/AIDS, Malaria, and Tuberculosis; the will to prioritize cervical cancer opened opportunities for the needed resources to come into play. The implication is that prioritization attracts support and drives stakeholders to act in favor of the cause. Although the leadership style of the government in Rwanda allows inclusive policy participation, the Rwandan government has been criticized for practicing soft authoritarianism. This approach to governance indirectly limits resistance to government policies, thus can silence alternative to policy ideas. The government mastered the art of bringing all material and immaterial resources together for the common good of the people.

Ghana may be similar to Rwanda with the practice of WTA politics where incumbent governments do not allow new ideas from their opponents. Where Rwanda differs from Ghana is its inclusivity of relevant stakeholders in policymaking, even when it is known they are of different political parties. Ghana has a well-established chieftaincy regime, which serves as a buffer between the government and the people. The chieftaincy system can become a policymaking instrument akin to how *Ubudehe* and *Imihigo* have been utilized in Rwanda as a policymaking instrument. Even though the chieftaincy system is respected in Ghana, their presence in the policymaking space is short-circuited due to the perception of their apolitical role in civil society. The chieftaincy system, however, is an essential conduit for advocacy because the system serves as the mouthpiece of the

communities. Chiefs (in some cases kings and queen-mothers) engage community leaders and government officials on social issues affecting their jurisdiction. While they are encouraged to be apolitical, the capacity as the mouthpiece of communities they serve means they can advocate for intervention for social problems that affect their community, thus bringing the collective voice of the people to bear and seeking political action. It is essential to point out that while the chieftaincy system is expected to be apolitical and typically plays an advocacy role for the people they rule over or serve, some chiefs/kings or queen-mothers possess more power than others and can influence the policymaking process because of their political clout or the national reverence earned. Such powerful chiefs/kings can also mobilize internal resources (material and immaterial) and sometimes external resources; therefore, they should not be ignored in the policymaking process. Canada and Rwanda have sizeable women's presence in governance. While women's participation in governance is not absent in Ghana, the number of women in government and other policymaking areas is abysmal compared to men. Opening the policymaking landscape for more women to enter and percolate ideas and alternatives, especially in policy areas relating to the well-being of women, is an important step to expand engaged interests in social problems for policy and reforms. Whereas the case in Ghana may be at distant variance with that of Canada, the vaccination program in Ontario, Canada, indicated that government priority setting, resource allocation, and buy-ins from policymakers can lead to policy success. Comparison of the decision to act by implementing a nationwide HPV vaccination in HICs, such as Canada and LMICs, such as Rwanda, and not acting due to resource constraints, such as in Ghana, has shown that governments can leverage creative approaches to act on a public problem successfully with or without plentiful resources.

For national HPV vaccination program policy success, Awolude and colleagues noted that the emphasis must be,

“avertable burden of disease, relative value of the vaccine compared with alternative uses of resources, affordability, likelihood of public acceptability, political support for a vaccine against a sexually transmitted disease, and feasibility of achieving high coverage in young adolescent girls”(Awolude et al., 2013, p. ix).

The plan to include a vaccine in a country’s immunisation program requires series of thoughtful considerations. Six of these factors have been deduced from this research that include a political will, funding, decision to offer the vaccine over competing health priorities, active issue networks or stakeholders to press government, active citizenry, and government interest.

**Table 21: HPV vaccination policymaking challenges in Ghana and the way forward**

Factors	Cause	Effect	Way forward
<b>Governance</b>	Political drive for expediency to allocate state resources for disease prevention and control is absent or low	Increase morbidity and mortality	Prioritize cervical cancer prevention by increasing healthcare expenditure to cervical cancer prevention and control
		Low score in international recognition for population health outcomes	Take advantage of Gavi assistance for HPV Vaccines
		Negatively impacts workforce due to higher loss of DALYs <sup>25</sup> (disability-adjusted life years)	Leverage HPV vaccine manufacturer’s assistance program for LMICs
			Develop a policy framework to implement a National HPV vaccination program.
			Bulk purchase vaccine with other sub-Saharan States at competitive price
<b>Funding</b>	Insufficient funds allocated for health expenditure	Increase morbidity and mortality	Take advantage of Gavi assistance program for HPV vaccines
		Low score in international recognition for population health outcomes	Leverage HPV vaccine manufacturer’s assistance program for LMICs
		Negatively impact workforce due to higher loss of DALYs (disability-adjusted life years)	Develop a policy framework to implement the National HPV vaccination program.
			Raise funds through internal and external sources

<sup>25</sup> The burden of disease is calculated using the disability-adjusted life year (DALY). One DALY represents the loss of the equivalent of one year of full health

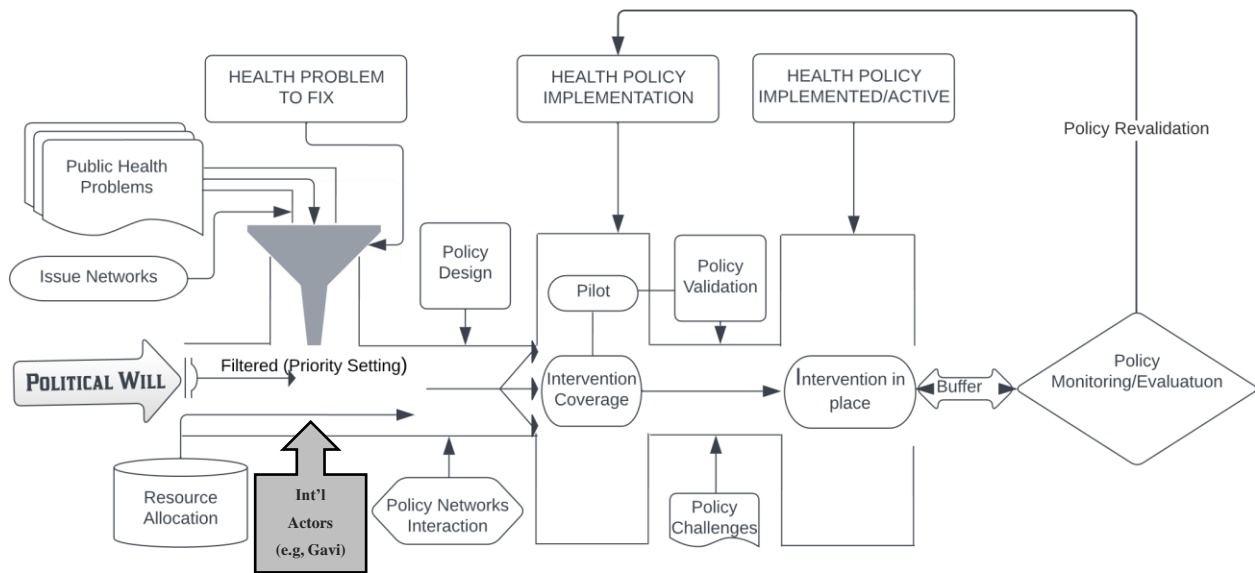
<b>Factors</b>	<b>Cause</b>	<b>Effect</b>	<b>Way forward</b>
<b>Decision to offer the vaccine over competing health priorities</b>	Endemic diseases such as Malaria, TB, HIV etc., given higher priority	Increase morbidity and mortality	Take advantage of the Gavi assistance program for HPV Vaccines in LMICs
		Low score in international recognition for population health outcomes	Leverage HPV vaccine manufacturer's assistance program for LMICs
		Negatively impact workforce due to higher loss of DALYs (disability-adjusted life years)	
		Health inequity is expanded	
<b>Active issue networks or stakeholders to press the government</b>	Civil society advocates are not well mobilized to sustain political traction and attention for policy and action	Low government priority setting	Increase awareness of HPV and HPV-related cervical cancer by organizing public awareness events, increasing media awareness, and engaging government policymakers on issues
		Low government resource allocation	
		Low awareness creation	
<b>Active citizenry</b>	Citizens are generally unreactive when issue networks are inactive or non-existent on health issues	Low government priority setting	Utilize the human rights framework to require the right to health be recognized by the government
		Low government resource allocation	
		Low awareness creation	
<b>Government interest</b>	Government interest in health issues is low	Increase morbidity and mortality	Abide by Abuja Declaration
		A low score in international recognition for population health outcomes	Abide by the Universal Declaration of Human Rights
		Negatively impact workforce due to higher loss of DALYs (disability-adjusted life years)	Abide by the International Covenant on Economic, Social, and Cultural Rights (ICESCR), including guidance from the Committee on Economic, Social and Cultural Rights that monitors the implementation of the ICESCR by State parties
		Health inequity is expanded	Abide by the joint Office of the United Nations High Commissioner for Human Rights (UNHCHR) and World Health Organization (WHO) on the Right to Health, including General Comments from the Special Rapporteur on the right to health
			See citizen's health as an economic tool and allocate resources as a value-generating activity

## 9.12 Research contribution to health policymaking

### 9.12.1 Schematic policymaking process framework

The schematic framework proposed (figure 9) can be utilized as a policy algorithm to provide a panoptic visualization of actions taken by policymakers and the political forces that propel policy choice to the implementation stages.

**Figure 9: Schematic flowchart of public health policymaking for intervention**



Source: author developed, 2023

This framework can be used to show the forces leading the policy to succeed or fail. Policymakers will benefit from this framework in two ways: 1) as a roadmap to garner political attention for priority setting, and 2) as a tool for assessing policy progression. While this flowchart may be used manually to determine and control the policymaking process, it is possible that this can be technologized with artificial intelligence (AI) within a system to make predictive outcomes at every stage of the algorithm based on inputs. This is a hypothetical and untested assumption, which require research to determine its feasibility and viability as an AI supported policymaking tool.

### 9.12.2 Policy choice stability check

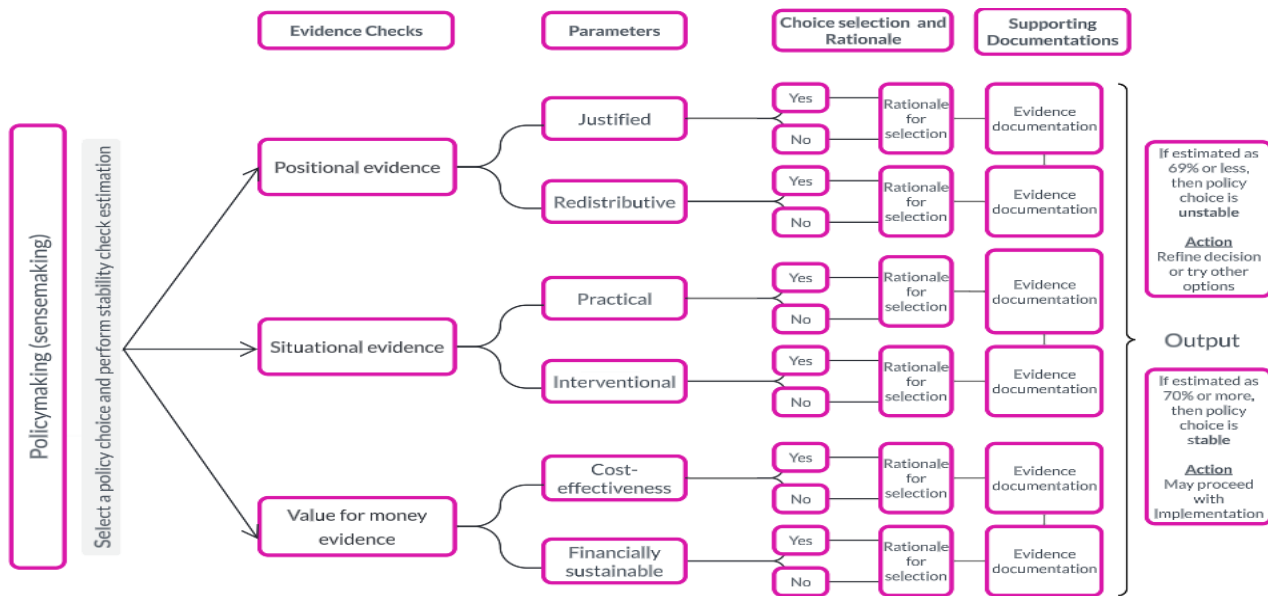
This research has made suggestion of policy stability check. It makes the assertion that public policymaking and the selection of a policy choice can be quantitatively determined to reveal whether the policy choice selected by policymakers will create value for government and the public in the long run. The policy choice stability check was suggestively applied as a test to estimate the sensemaking policymaking approach used in the Canada nationwide HPV vaccination program. While sensemaking, like many other policymaking tools, is not devoid of inherent weaknesses which can arouse bias and thus blind policymakers' decision-making capacity, a tool to test its stability can build trustworthiness in policymaking. Thus, the policy choice stability check suggested could serve as a validator of the policy decision as an important step in the policymaking process. The policy choice stability check formulated uses the following parameters: 1) positional evidence- where the premise of the normalized policy choice is justified and redistributive, 2) situational evidence-where the policy choice is practical and interventional, 3) value for money evidence- where the policy choice is proven to be cost-effective and provides present and future financial sustainability. This is simplified in the table below with a proposed formula that estimates the policy choice stability check in the policymaking process.

**Table 11: Proposed policy choice stability check estimator**

<b>Policymaking Process</b>	<b>Positional evidence</b>	<b>Situational evidence</b>	<b>Value for money evidence</b>
Sensemaking ( <i>example</i> )	policy choice is: 1. Justified <input type="checkbox"/> Yes <input type="checkbox"/> No 2. Redistributive <input type="checkbox"/> Yes <input type="checkbox"/> No	Policy choice is: 1. Practical <input type="checkbox"/> Yes <input type="checkbox"/> No 2. Interventional <input type="checkbox"/> Yes <input type="checkbox"/> No	Policy choice is: 1. Cost-effective <input type="checkbox"/> Yes <input type="checkbox"/> No 2. Financially sustainable <input type="checkbox"/> Yes <input type="checkbox"/> No

$$\text{Policy Choice Stability Check} = \frac{7 + (\text{Number of "YES" Replies} - \text{Number of "NO" Replies})}{1 + (\text{Total Selectable YES} + \text{Total Selectable NO})} \times 100$$

**Figure 4: Algorithmic representation of the proposed policy choice stability estimator**



Source: author developed, 2023

A policy stability check of greater than 69% indicates that the policy choice made will likely offer a sustainable and stable outcome on a long-term basis. A score less than 70% signals potential instability or unsustainability of the policy choice to reach optimal benefit to public and return on investment to the government. It would be advisable that a policy stability check of less than 70% be reviewed and the decision made revised. Seventy percent is selected because it is conservative and covers the critical areas of public and governmental concerns. This tool can be useful to policymakers as a check to the policy choice they make to predetermine the chances of policy failure or success when the intervention is in full implementation. The tool is suggestive and hypothesised to make meaning of sensemaking. It thus, requires further testing for validation to establish its robustness, as such must be applied in policymaking with lots of caution.

### 9.12.3 Strength and Limitations

Conducting a comparative study that intersects health policy interest and resource capacity and allocation to illuminate understanding of nationwide HPV vaccination among countries in high

income (Canada) and low-middle income (Rwanda and Ghana) regions is a strength, nonetheless, some study limitations exist. For example, while a list of stakeholders was identified and contacted for interviews for the Ghana and Rwandan case studies, only a small number responded. This can be attributed to the duration (January 2022-April 2022) in which the study was conducted and the possibility that some identified stakeholders may have been heavily involved in COVID-19 related activities. This limitation is compensated for by the mixed data collection approach which complemented the short comings of each other through data triangulation. Although the methodological approach of triangulation across governments and literature sources in which HPV vaccine program designers shared their insights along with key informant interviews offers a sound approach, additional key informant interviews could have further clarified the Rwanda and Ghana cases.

### **9.13 Conclusion**

A problem arising from policy inertia for a public issue reflects the lack or absence of public accountability by government and its responsible agencies for policymaking. Accountability is a social relationship in which an individual or agency is held responsible to answer for performance expected by a significant stakeholder or party (Robinson, 2003; Romzek & Dubnick, 2018). Proof of action to function towards the duty to perform with either tangible or intangible signs at the time of evaluation must be demonstrated. According to Tuohy, accountability hinges on identifying responsibility of action or inaction of those “*whom to hold accountable for what*”, provision of information influencing outcomes of decisions by those vested with the fiducial power to be responsible for them (*not necessarily making the decisions*), and mechanisms to penalize or reward performances of set goals (Tuohy, 2003, p. 196). Wherein misdirection towards the performance of relevant government agency’s responsibility to perform as expected by the people exists, this suboptimal performance is reflected in the lived experiences of the people. For example, Ghana has



documented in its National Strategy for Cervical Cancer Control in Ghana 2012-2016, among many promises, that “Catch up immunisations [HPV vaccine] will be provided for girls aged 15 -18 years”, however there is no evidence of this being done.

The situation in Canada and Rwanda is different. Rebuilding the Rwandan health system post-genocide was focused on “ready access and accountability” (Binagwaho et al., 2014, p. 371). The dissimilarities in policy action among the countries, particularly, Ghana and Rwanda, is indicative that governance and political will drives policy prioritization and resource allocation. This aligns with government accountability for their responsibilities to the people. Governments are accountable for their actions or inactions as part of their commitment to the people they serve. While accountability is touted as a governance tool for policy success, it is equally important to note that accountability runs the risk of blame-gaming. This occurs as accountable entities or stakeholders excuse away an expectation or performance failure for reasons that may/or may not necessarily be attributable to their actions or inactions. The challenge of policy implementation in Ghana has been attributed to funding constraints, which is understandable considering that as a LMIC, other competing priorities shift focus to disease areas governments consider to be of high priority. However, the cases in Canada and Rwanda reflect that political will through priority setting and resource allocation, taking advantage of windows of opportunities, utilizing available resources and tools, and prudently leveraging aid when available is key to success. Ghana can learn from Canada and Rwanda, adopt, optimize, and/or leverage insights from the national HPV vaccination policymaking process of these countries. A national HPV vaccination program in Ghana will be a public health good that can enhance the government’s performance accountability for public health. As a global metric, this would reflect the government’s fulfilment of the Abuja Declaration (1989) concerning the right to health.

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## 11 APPENDICES

### Appendix 1: A historical perspective on HPV associated cervical cancer and HPV vaccine discovery.

#### Abstract

Hausen and colleagues, using gene cloning technique and the application of hybridization procedures, made a breakthrough by isolating HPV strain 16 and 18 as two high risk HPV causative agent for cervical cancer. The isolation of HPV 16 and 18 led Ian Frazer and his colleague Jian Xhou to use non-infectious virus-like particles (VLPs) to develop a vaccine against the high-risk HPV strains. Frazer and his colleague Xhou proved in their experimentation that their vaccine was 95% effective at preventing HPV-associated disease caused by the HPV 16 and 18. With over 70% cervical cancer caused by HPV 16 and 18, the discovery paved the way for Merck and GlaxoSmithKline to invest in the vaccine development stages and eventual HPV vaccine commercialization towards the prevention of cervical cancer. Continuing data on HPV vaccine efficacy and safety shows that the vaccine is safe and efficacious with minimal side effects reported since its introduction.

#### Introduction

In 1842, the Italian Physician Rigoni-Stern, analysed the death certificates of women in Verona, Italy, from the period 1760-1839, and noted that cancer of the uterus was a common cause of death among women who purportedly had or have had sexual encounters (e.g. married women, widows, prostitutes) as opposed to those who did not (e.g. nuns and virgins) (Griffiths, 1991; Syrjänen & Syrjänen, 2008; Hausen, 2009; Gissman, 2012). Rigoni-Stern concluded that cancer of the uterus (cervical cancer) was linked to sexual encounters (Syrjänen & Syrjänen, 2008; Griffiths, 1991). In 1949, Versluys also conducted an assessment of cancer mortality among nuns in the Netherlands and concluded that cervical cancer deaths among married women (5.92%) was higher than among unmarried women (2.33%), and out of 179 deaths, only five were nuns (Versluys, 1949). Fabien Gagnon who believed that irritations or infections around the cervix (cervicitis) was probably a cause of cervical cancer, also conducted a study to establish cervical cancer rate among 13,000 nuns for a period of 20 years (Gagnon, 1950). He concluded that the rate of cervical cancer among nuns was akin to single women and far below married women (ibid). Similar works were conducted by Janet Towne (Towne, 1955) and Joseph Fraumeni and colleagues (Fraumeni Jr et al., 1969), all of which aligned with Rigoni-Stern's observation that cervical cancer was prevalent among women who were exposed to sexual encounters. Malcolm Griffiths, who performed an assessment of Rigoni-Stern's assertion and the works of his contemporaries however pointed to shortcomings in these studies and thus, weaken the assertion that sexually unexposed women were least likely to get cervical cancer (Griffiths, 1991). For instance, Griffiths point out that Rigoni-Stern's "observations made are not of statistical significance" (p.797); Versluys' research finding "account is unclear", however, Griffiths agree this account may be based on age-adjusted rate (p.799); Gagnon's admittance of his results being disturbed by possible statistical errors "makes his conclusions seem even more dubious" (p.799). According to Griffiths, while a number of studies show relationship between marital status as a risk factor to cervical cancer, this relationship is not always the case as "[t]he use of such relative risk factors ignores the absolute risk" (Griffiths, 1991, p. 801).

In the early 1970s, Harald Zur Hausen and his team, after embarking on several challenging experiments on anogenital cancer with little success, the team proceeded to finding out the "roles of other viruses in human genital cancer" (Hausen, 1987, p. 1692). The research interest to find a correlation between HPV infection and cervical cancer peaked around the 1970s-1980s (Hausen, 1987; Syrjänen & Syrjänen, 2008). Markedly, this led to the discoveries of different strains of HPV (Gissmann et al., 1977, 1984). By 1976, Meisel and Fortin made a lead discovery that pointed to HPV as a causal agent in abnormal cervical cytology (Meisels & Fortin, 1976). The discoveries set new grounds and made it easier for researchers like Hausen to continue their work with more clarity. By 1984, Hausen and his team, using gene cloning technique and the application of hybridization procedures, made a breakthrough by isolating HPV strain 16 and 18 and linking these two strains as the predatory agent causing cervical cancer (Gissmann et al., 1984; Kahn et al., 1986). These two isolated oncogenic strains of HPV (16 and 18) have been linked to cause over 70% of all uterine cervical cancer.

It is worth mentioning that Hausen received the Nobel Prize in Physiology or Medicine in 2008 for his role in the discovery of the oncogenic HPV strains (16 and 18).

**Table 1: HPV Infection and Associated Cancer Risk**

Risk of Cancer	Infection Site	
	Skin	Genital
High risk (Flat lesions)	HPV5	HPV16
	HPV8	HPV18
Low risk (Warty lesions)	HPV1	HPV6
	HPV2	HPV11

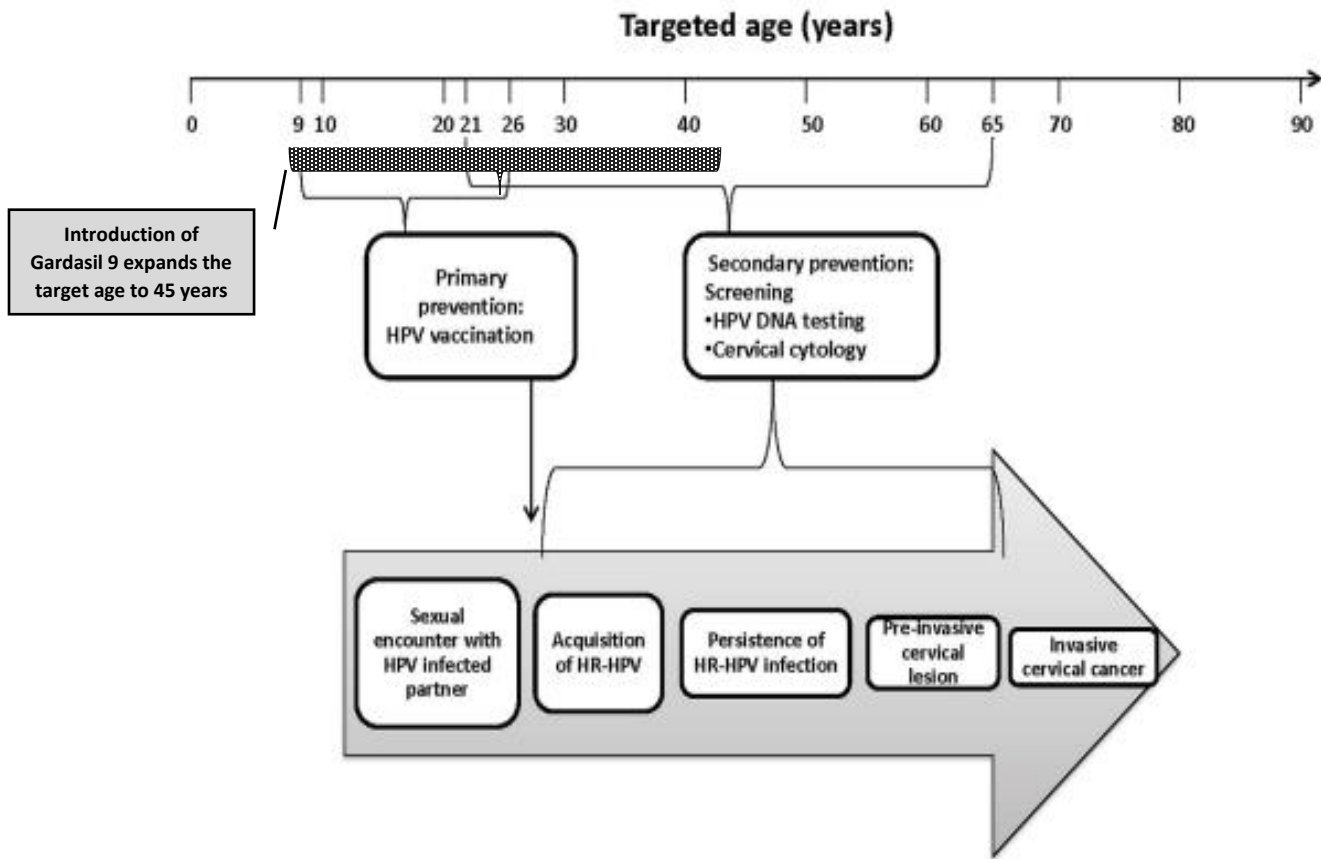
Data Source: Frazer, I. (2006). God's gift to women: the human papillomavirus vaccine. *Immunity*, 25(2), 179-184., p. 180

The discovery of HPV strain 16 and 18 as primary (high risk) causative agent for cervical cancer led to another search for solutions that will protect against cervical cancer. By 1989, Tidy, Mason, and Farrell developed the first screening (HPV DNA testing) method to detect HPV infection of the cervix by checking for HPV virus (Tidy et al., 1989). Coupled with the pap test, this new testing approach (HPV DNA) opened a new window to enhance the detection of cervical intraepithelial neoplasia (CIN) or precancerous lesion in the cervix. Pap test was developed by Georgios Papanikolaou and his colleague Aurel Babeş in the late 1920s to screens cancerous cells in the cervix and detect any changes or abnormal cells in the cervix area that can be cancerous (Tan & Tatsumura, 2015). The pap test provides a chance for early treatment when cancerous cells are identified. Other complementary development to this approach have been liquid-based cytology and the visual inspection with acetic acid (VIA). While these methods (among others) have proven effective in their respective discoveries and efficiencies, vaccination has proven to be historically exceptional in prevention and the control of viral agents.

In early 1990s, Ian Frazer and his colleague, Jian Xhou, set out to find a prophylactic HPV vaccine after the two met during Ian's sabbaticals at Cambridge University (Frazer, 2006; Zhou et al., 1992). Frazer and Xhou through their collaboration were able to "[find] a way to form non-infectious virus-like particles (VLPs) that strongly activated the immune system" (Haas et al., 2009, p. 5). This paved the way for the first HPV vaccine development for HPV 16 and 18 (high risk strains). Merck (together with the Australian biotechnology company, CLS) saw the potential in Frazer and Xhou's new development and thus, sponsored the clinical trials on the vaccine (Scolnick, 2018). The findings from the clinical trials of the vaccine indicated that it was "[approximately] 95% effective at preventing HPV-associated disease caused by these genotypes in virus-naïve subjects" (Frazer et al., 2011, p. 111).

Merck and GlaxoSmithKline Biologicals (GSK) become the two major pharmaceutical companies that invested in commercial productions of the HPV vaccine. On June 8, 2006, the U.S Food and Drug Administration approved Merck's HPV antiviral vaccine, Gardasil® "for females 9-26 years of age to protect against cervical, vulvar and vaginal cancers caused by [HPV]" (FDA, 2009). Human Papillomavirus Bivalent (Types 16 and 18) Vaccine, Recombinant (a.k.a. Cervarix), "for use in females 10 through 25" years manufactured by GSK received approval from the U.S. FDA on October 15, 2009 (FDA, 2019). Figure 1 is Snipped and modified from Tota and colleagues (2014).

**Figure 1: Age Bracketed HPV Vaccination Intervention Strategies**



Vaccine	Population	Age Group	Schedule
Cervarix®	women	9-25 years	3 Doses: 0, 1, and 6 months
Gardasil® 4	Women and Men	9-26 Years	3 Doses: 0, 1, and 6 months
Gardasil® 9	Women and Men	9-14 Years	3 Doses: 0, 1, and 6 months
		15-45 Years	2 Doses: 0, 6 to 12 months

It is noted that some OECD nations “including England, New Zealand, Australia, Italy, and The Netherlands” are moving away from cytology as the primary screening approach for cervical cancer and focusing on HPV screening and vaccination (Hariri et al., 2013; Simms et al., 2016). Originally, the HPV vaccination regimen was designed on a 3-dose program to be given at 0, 2, and 6-month time point. However, Dobson and colleagues in a randomised clinical trial study of HPV vaccine in younger adolescents, showed that a 2-dose schedule for girls was “possible” (Dobson et al., 2013, p. 1793). While this is the case, a cohort study of 10,204 women in Alberta, Canada concluded that women who received full vaccination (> 2 doses) had a lower adjusted odds ratio (OR) of 0.72 (95% confidence interval [CI] 0.63–0.82) (Kim et al., 2016, p. E284). Those who had 2 dose HPV vaccination had adjusted OR of 0.50 (95% CI 0.30–0.85) (ibid). This study suggests that the 3-dose regime provided greater protection and lowers the risk of cervical cancer among women. Even though the 3-dose schedule may provide lower risk, a cost effectiveness assessment conducted by Laprise and colleagues have shown that a 2-dose schedule that provides a latent protection period of at least

10 years is cost effective (Laprise et al., 2014, p. S845). The authors concluded vaccination with 2-dose schedule that provides “longer than 30 years” protection period is better than a 3-dose schedule (ibid). The two-dose schedule has been also recommended by WHO (WHO et al., 2006; WHO, 2014). While some countries maintain the 3-dose schedule, Canada (PHAC, 2015) and the U.K (Small Jr et al., 2017), as well as many other OECD nations have adopted to use the 2-dose schedule for its efficacy and cost effectiveness.

The FDA and the Center for Disease Control and Prevention (CDC) attest to the safety and efficacy profile of the HPV vaccines. Other studies have also indicated that HPV vaccines by Merck and GSK are safe and effective with minimal side effects (Agorastos et al., 2009; Chao et al., 2012; Lu et al., 2011; Zimet et al., 2013). Even with coadministration with other vaccines, HPV vaccines have been proven to be safe with noninferiority of immune response (Gilca et al., 2018; Noronha et al., 2014). In a cross-sectional analysis of the U.S National Immunization Survey from 2015-2018, there was a 79.9% increase in parents who refused HPV vaccines for their adolescent citing safety concerns (Sonawane et al., 2021, p. 1). At the time, the authors noted that the U.S national vaccine safety surveillance system reported HPV vaccine adverse event per 100,000 doses distributed decreased from 44.7% in 2015 to 29.4% in 2018 (ibid). During the time frame (2015-2018), the total of 16,621 adverse event reports following HPV vaccination were reported to the U.S National Immunization Survey (NIS) and Vaccine Adverse Event Reporting System (VAERS) of which 95.4% (15 863) were reported as Nonserious adverse events, while 4.6% (758) was reported as serious adverse event (Sonawane et al., 2021, p. 6). The authors noted that “a rise in citing safety concerns was observed among parents with HPV vaccine hesitancy” (Sonawane et al., 2021, p. 1). Despite the evidence of HPV vaccine’s safety and effectiveness, it has received forceful pushbacks from social, culturally sensitive, and political groups (Wailoo et al., 2010; Tomljenovic & Shaw, 2012, 2013). For instance, it is reported that in Denmark, HPV vaccine uptake which begun in 2009, maintained resilience, then declined between 2013 and 2015 due to negative media coverage of the vaccine’s safety and effectiveness (Hansen et al., 2020; Suppli et al., 2018). A National information campaign about HPV vaccines safety and effectiveness between 2017 to 2019, which countered the negative media coverage, fortunately, re-charted an uphill increment in uptake of the vaccine in Denmark (Hansen et al., 2020). In Japan, the country suspended the use of the vaccine in its national immunization program due to some isolated cases of “chronic pains and other symptoms [experienced] in some vaccine recipients” (*GACVS\_HPV\_statement\_17Dec2015.Pdf*, n.d., p. 3). While Japan reported a vaccination rate of 70% just three years after the introduction of a national HPV vaccination program, this rate quickly fell to “less than 1%” as a result of the publication of side effects (Fujiwara & Quinn, 2020, p. 125). To uphold a continual safety and efficacy information of the HPV vaccines, it has been recommended that a post-market/licensure monitoring (pharmacovigilance) is conducted to collect data to establish safety of use of the vaccine on a continual basis (LaMontagne et al., 2017). In 2015, the WHO’s subsidiary, the Global Advisory Committee on Vaccine Safety (GACVS), upon reviewing study data from France, confirmed that the HPV vaccine safety profile continue to be consistent and stable in maintaining its integrity (WHO, 2015, p.1). This provides assurance that the risk of administering the vaccine remains low. This premise gives vaccine manufacturers confidence to penetrate political space to lobby and sell their vaccines, and at the same time providing salient information to convince antivaccine and resistive stakeholders.

## **Conclusion**

Vaccines will continue to remain an important public health intervention. The recent COVID-19 pandemic speaks into this. When it comes to HPV vaccination, the evidence shows that the vaccine can effectively prevent HPV-related cervical cancer when administered early to adolescents prior to debuting sex. While vaccine hesitancy remains a challenge to vaccination programs and a threat to public health, it is necessary for governments to continue to engage with vaccine hesitancy groups to bridge science-based evidence and knowledge and societal norms and beliefs.

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## Appendix 2: Vaccines, vaccination, and anti-vaccines: an unending public health standoff

### Abstract

Human life has improved and to a larger extent preserved because many deadly diseases have been eradicated or brought under control through the interventions of vaccines. While this is the case, public vaccination continues to receive backlash from anti-vaccine individuals and groups for various reasons. A historical analysis of vaccines and vaccination is used to shed light into vaccine hesitancy and its effects on public health. HPV and COVID-19 vaccines are cited to delineate how vaccines for these diseases have saved and continue to save lives. This review shows that misinformation, ignorance, and cultural beliefs are mechanisms that perpetuate vaccine hesitancy. This is hinged on entrenched stakeholders' positions and interests that deviate from public health advice. Deliberate effort on the part of governments to educate, engage, and create neutral non-adversarial platforms where vaccine hesitant individuals or groups can present their position and equally receive the position of the government in a transparent dialogic space is important. The review proposes the utilization of social media tools, news media outlets, and advertising platforms as areas vaccine education can begin and create opportunities for conversations to begin.

**Keywords:** Vaccine, Vaccination, vaccine hesitancy, government, public health

### Introduction

Vaccines come in different forms, however, the mechanism of how they work is nearly the same. Vaccines may be live attenuated (uses weakened form of the disease causing germ), inactivated purified organisms (uses killed versions of the diseases causing germ), sub-units/ recombinant/ polysaccharide/ conjugate (uses specific pieces of the germ, e.g., protein, sugar, or the capsid (casing around the germ), toxoids (uses a toxin made by the disease causing germ), and viral vector (uses modified version of a different virus), and in recent times, messenger RNA (mRNA) (trigger immune response by producing protein) vaccines. Vaccines may be prophylactically introduced into living organism (vaccination) to provide immunity and prevent infectious disease or its sequelae. The history of vaccination can be traced back to early Chinese medicine (Horton, 1995; Leung, 2011; Duggan et al., 2016). In the 1400s to late 1700s, smallpox (caused by variola virus) was endemic in Europe with sporadic “epidemics that ravaged whole cities, killing nearly 30% of the victims” (Artenstein et al., 2005, p. 3). Nobody was exempt. For example, some notable people who were infected with the disease included “Louis XV of France (who died of the disease) and King Charles II and Queen Elizabeth I of England” (Geddes, 2006, p. 154). In the latter part of 1700, Edward Jenner, through series of human experimentation established a firmer ground for the discovery of a potent vaccine for smallpox (Jenner, 1788, 1800, 1824; Baron, 2014; Riedel, 2005). In his experiment, Jenner successfully inoculated an 8-year-old boy, James Philips, with a pus that was taken from a smallpox lesion of a cow (Jenner, 1800). The pus of the cow contained the infection causing virus, *vaccinia virus*, from which the word vaccine originates. Jenner variolated (the inoculation into the skin of a healthy subject with a pus) the boy after six weeks at different locations around his arms with more smallpox pus (Riedel, 2005; Kramer, 2012). The increasing dose had no effect on the boy. Jenner repeated his experiment over a dozen times with other subjects. He obtained similar results as that recorded for James Philips. His publications on this finding provided enough evidence of the vaccine's efficacy, potency, and safety, and thus set the basics for vaccine study -vaccinology (Lombard et al., 2007; Payette & Davis, 2001; Plotkin & Plotkin, 2004; Stern & Markel, 2005). It is however important to mention that, prior to Jenner's experiment, variolation has been employed by some aristocrats in Britain such as Lady Mary Montagu and the Princes of Wales, Caroline of Ansbach (Geddes, 2006). Also, it has been reported that Benjamin Jesty was already conducting variolation with his family over two decades before Jenner's experiment (Hammarsten et al., 1979; Horton, 1995; Pead, 2019). This has led to a long debate as to who should be credited the father of vaccinology, for Jenner (Willis, 1997; Riedel, 2005) and Jesty (Pead, 2006, 2017, 2019). Vaccines are critical public health tools that have saved millions (if not billions) of lives. As Poland and Jacobson point out, it is “one of the few cost-effective medical measures that result in universal

benefit” (Poland & Jacobson, 2001, p. 2440). The novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), (a.k.a. Coronavirus Disease 2019 (COVID-19), which reportedly surfaced in Wuhan, China, in late 2019 and spread worldwide reemphasized the importance of vaccination. COVID-19 has overwhelmed the world, devastating global public health and compelled the World Health Organization (WHO) to call for a public health emergency of international concern (PHEIC) on 30 January 2020 (WHA, 2020). The global health disruption brought on by COVID-19 has been felt in nearly all nations of the world, causing global economic shakedown in diverse ways. This showcases how an upshot of disease in one region can quickly destabilize global economy, testing national healthcare systems, and overarching public health readiness for pandemics. While vaccines have proven phenomenal in their therapeutic benefits to society, there are challenging social pushbacks that extends into different spaces of public health. These challenges attract fierce political, social, cultural, religious, scientific, and economic attentions for various reasons (Stern & Markel, 2005; Marti et al., 2017; Kieslich, 2018). For example, some have considered vaccination as a breach to their “bodily integrity” (Stern & Markel, 2005, p. 617). There are those who have also raised concerns about the “credibility of scientific evidence” of vaccine’s efficacy and safety profiles (Kieslich, 2018, p. 30). These concerns present a difficult situation of adjusting trust, public confidence, and risk of vaccine safety and efficacy (Marti et al., 2017; Larson et al., 2018). Interestingly, vaccine pushback became prominent when Britain introduced its smallpox vaccination program where people were forced to vaccinate against the disease (Barquet & Domingo, 1997; Hobson-West, 2007). The forced vaccination regime set the grounds for the public to react and resist vaccination through public boycotts (ibid). On 15 January 2022, anti-vaccine Canadian truckers (a.k.a. Freedom Convoy) moved themselves all over the nation to converge in Ottawa, the seat of government to express their aversion to vaccinate to be able to make unhindered trips between Canada and the U.S. The Canadian government in a bid to contain COVID-19, had tighten its protocols and mandated that all unvaccinated Canadian truckers who crossover to the U.S quarantine upon return. While the truckers begun their protest from the west of the country and drove east to Ottawa, a significant number of people lined up along highways and cheered them on as they made their journey to the east. The margin of the public cheering the Freedom Convoy on is indicative that a good section of the population continues to resist vaccination. Not only does these actions of the truckers led to an already bad situation of shortage of essential commodities on the shelf, and slowing of businesses that rely on trucking, but the actions of the truckers also expressed how much effect mobilized stakeholders exert on public health and the economy in unsettling ways. According to the WHO’s Strategic Advisory Group of Experts (SAGE) Report, vaccine hesitancy is the “delay in acceptance or refusal of vaccines despite availability of vaccination services.” (WHO, 2014, p. 7). Vaccine hesitancy, according to Poland and Jacobson, unfortunately leads to “major disruption and even cessation of vaccine programs, with resultant increased morbidity and mortality” (Poland & Jacobson, 2001, p. 2440). As Stern and Markel put it, “vaccines are powerful medical interventions that induce powerful biological, social, and cultural reactions” (Stern & Markel, 2005, p. 612). While this is the case, copious evidence continue to prove that social groups or individuals who hesitate to vaccinate usually do so on unscientific basis (Hobson-West, 2007; Marti et al., 2017; MacDonald et al., 2018). For example, in 2008, during the rollout of Human Papillomavirus (HPV) vaccine in schools in Calgary, Canada, the Catholic schools did not favour this agenda and refused to collaborate with the program (MacDonald, 2015, p. 4162). However, by 2013, this had been overturned to align with non-Catholic public schools that were scheduled on the in-school access to HPV vaccination program(ibid). At the 73<sup>rd</sup> World Health Assembly (WHA) in May 2020, resolution 6 emphasized on the “extensive immunization against COVID-19 as a global public good for health in preventing, containing, and stopping transmission in order to bring the pandemic to an end, once safe, quality, efficacious, effective, accessible and affordable vaccines are available” (WHA, 2020, p. 3). Despite this resolution, vaccine hesitancy continued to threaten mass vaccination programs. For example, in a systematic review of 31 published papers on COVID-19 vaccine hesitancy in 33 countries, the author pointed out that for the studies reviewed “COVID-19 [vaccine] acceptance rate[was] below 60% (Sallam, 2021, p. 10). A similar review of 53 full text articles on Global COVID-19 vaccine acceptance in different populations conducted by Salomoni and colleagues also showed that vaccine hesitancy is an “increasingly wide-spreading phenomenon” (Salomoni et al., 2021, p. 21). In the modelling of COVID-19 pathogenesis for example, some researchers have estimated that over 60% herd immunity was necessary to stop the spread of the disease (Anderson et al., 2020; Billah et al., 2020). This leads



to the reasoning that vaccine hesitancy and low vaccine uptake especially in times of public health crisis can potentially put everyone that is exposed at health risk. The draw backs in vaccination due to vaccine hesitancy, as shown in the COVID-19 case presents a complex public health problem. This complexity rest on social acceptance and how some groups of society move along accepting some vaccines and rejecting others based on knowledge, culture, beliefs, misinformation, and other such reasons (Larson et al., 2014; WHO, 2014; MacDonald et al., 2018). For example, some vaccine hesitant have the belief that COVID-19 is “connected to 5G mobile network radiation” (Allington & Dhavan, 2020, p. 1). Due to the complexity of vaccine hesitancy and how it touches on people’s sociocultural inclination, special attention to adjust and calibrate the behavior of people especially those who oppose vaccination is a consideration public health experts and governments must make to improve overall acceptability. Larry Pickering of the National Center for Immunization and Respiratory Diseases (Centers for Disease Control and Prevention) in his beginning foreword to “*Vaccinophobia and Vaccine Controversies of the 21st Century*,” clearly point to this problem that,

“As long as there has been scientific advancement, there has existed the possibility that reports of its origins, safety, efficacy, and implementation would be twisted and misunderstood—either intentionally or unintentionally—to further agendas that reach far beyond the pure science of discovery itself” (Chatterjee, 2013, p. vii).

In an earlier writing, Plotkin raised three fundamental issues that must be addressed in order to optimize vaccine acceptance and accessibility; “safety and the rise of [vaccine hesitancy], cost for developing countries, and adequacy of supply” (Plotkin, 2003, p. 1357). Addressing vaccine hesitancy will require that vaccine hesitant groups/individuals and governments must work closely to reconcile on the risk-benefits profiles of vaccines to heighten vaccine legitimacy in society. This will produce a new social perspective to build a framework for universal vaccine acceptance. The Freedom Convoy situation in Canada provides excellent opportunity for the government of Canada and the truck drivers association to come to a compromise that will not jeopardize public health. Assurance of having public health interest at the fore with evidence of reduction in disease incidence and mortality because of vaccination is likely to shift the mindset of hardcore anti-vaccine individuals and groups. In this purview, some have suggested increasing social research to better understand what informs people in their vaccine decision making choices (Bostrom, 1997; Streefland et al., 1999; Shapiro et al., 2018; McDonald et al., 2019). Transparency and accountability on the part of governments to citizens with regards to scientific data on vaccines, purchasing and even deployment strategies should be a norm that society is privileged to. This can allow government and the society to fuse together on areas where agreement exist, and leverage on this agreeableness to locate the areas of disagreement and find equitable solutions that benefits society at large. Another approach to increasing vaccine acceptance is through education. MacDonald and colleagues have emphasized on effective communication strategies that “address[es] anti-vaccine misinformation and vocal vaccine deniers in public” (MacDonald et al., 2018, p. 220). Utilizing social media tools and news media outlets, and advertising platforms are areas vaccine education can begin and create opportunities for conversations to begin. While a part of the public continues to express lack of confidence in vaccine manufacturers, governments must represent the public by making sure vaccine manufacturers present exactly what their products say it represent and is fit for purpose. Whereas trust among the public, government, and vaccine manufactures remain problematic, engaging these three pillars in the interest of public good while creating shared value must be the core and converging point of gains.

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## Appendix 3: Inform consent form

### INFORMED CONSENT FORM

Name of Participant: \_\_\_\_\_

Date: \_\_\_\_\_

**Study Name:** HPV Vaccine Access and Cervical Cancer Policy-Making Process: A Comparative Governmental Priority Setting Study of Ghana, Rwanda, and Canada.

**Researcher:** Eric Asempah (PhD Candidate), Faculty of Health, York University, North York, M3J 1P3.

Tel: (647)-705-1399. Email: [easempah@yorku.ca](mailto:easempah@yorku.ca)

**Purpose of the Research** To explore the priority setting and policymaking environment within which HPV vaccine access and uptake in Ghana operates and how the policy instruments that are in place limit (engage) or delimit (disengage) the determinants (factors) of health inequality or inequity as far as right to health is concern.

I will seek to answer my research question by firstly focusing on the policy environment within which HPV vaccine access and uptake in Ghana is organized and deployed. The situation in Ghana will be compared to Rwanda and Canada. The rationale for the comparative analysis is because Ghana remains a high-risk nation for cervical cancer and has low government support/interest when it comes to cervical cancer prevention and control. Rwanda currently is considered medium risk with high HPV vaccine uptake as a result of a proactive governmental prioritization of cervical cancer in its public health policy. Canada is one of the OECD nations with a successful HPV policy (relatively low risk, high governmental ownership).

Mixed method (qualitative and quantitative) approach is employed. I will combine interviews and questionnaires to collect data for this research. The Data collected will become part of the material to inform my PhD dissertation.

**What You Will Be Asked to Do in the Research:** You will be requested to spend about 60 minutes (1 hour) of your time for a sit-in, phone, or VOIP (e.g., Zoom, Skype) call interview to get your perspective on HPV vaccination and cervical cancer in your country and how government policy improve or exacerbate cases of HPV infection and consequently HPV-related cervical cancer. If you do not have sufficient time, a simple structured questionnaire will be provided to you in person or by mail for you to answer at a reasonable time that is convenient to you.

The researcher will be available to explain any question that you will need further clarification on. You may be provided with a pen or pencil in the process of filling out any document pertaining to this research.

**Risks and Discomforts:** I do not foresee any risks or discomfort from your participation in the research. You have the right not to answer any questions.

**Benefits of the Research and Benefits to You:** The data collected from this research will be used to aid policy interventions on HPV vaccination and cervical cancer control and prevention in Ghana and other countries that have similar situations like Ghana. The outcome is expected to provide tools and/or framework that can help policymakers make informed decision from a holistic perspective with the social obligation of promoting right to health as a human right.

Participants may benefit from equitable government policy that reduce their risk to HPV infection and cervical cancer; thus, promoting health and in effect promoting social and economic good.

**Voluntary Participation:** Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence the relationship you may have with the researcher or the nature of your relationship with York University either now, or in the future.

**Withdrawal from the Study:** You can stop participating in the study at any time, for any reason, if you so decide. Your decision to stop participating, or to refuse to answer any questions, will not affect your relationship with the researcher, York University, or any other group associated with this project. In the event you withdraw from the study, all associated data collected will be immediately destroyed permanently wherever possible.

**Confidentiality:** All information you supply during the research will be held in confidence, and unless you specifically indicate your consent, your name will not appear in any report or publication of the research. All individual information collected will be coded to avoid a risk of third-party tracing. Interviewing data will be collected by journaling participant's comments into a dedicated journal for this research. This will later be transcribed into a Microsoft word document and stored in a pass-worded folder on the researcher's laptop and only research staff (e.g., supervisor or dissertation committee members) will have access to this information. Research data will be stored for a minimum period of two years, after which it will be shredded. Confidentiality will fully be provided.

**Questions About the Research?**

If you have questions about the research in general or about your role in the study, please feel free to contact me at [easempah@yorku.ca](mailto:easempah@yorku.ca) or my supervisor, **Prof. Mary E. Wiktorowicz** at [mwiktor@yorku.ca](mailto:mwiktor@yorku.ca) and/or **416 736 2100 Ext. 22124**. You may also contact the Graduate Program in Health at [gradhlth@yorku.ca](mailto:gradhlth@yorku.ca) and/or (416) 736-2100 Ext. 44494.

This research has been reviewed and approved by the Faculty of Health Research Committee, on behalf of York University, and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5<sup>th</sup> Floor, Research Tower, York University (telephone 416-736-5914 or e-mail [ore@yorku.ca](mailto:ore@yorku.ca)).

**Legal Rights and Signatures:**

I, \_\_\_, consent to participate in “**HPV Vaccine Access and Cervical Cancer Policy-Making Process: A Comparative Governmental Priority Setting Study of Ghana, Rwanda, and Canada.**” conducted by **Eric Asempah**. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

**Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

Participant

**Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

Researcher (Principal Investigator)

## Appendix 4: Online inform consent and survey questionnaires

Google Form Online Survey:

# Human Papillomavirus (HPV) Vaccine Access and HPV-Related Cervical Cancer Awareness

Survey Informed Consent

Study Name: HPV Vaccine Access and Cervical Cancer Policy-Making Process: A Comparative Governmental Priority Setting Study of Ghana, Rwanda, and Canada

Researcher: Eric Asempah (PhD Candidate), Faculty of Health, York University, North York, M3J 1P3. Tel: (647)-705-1399. Email: [easempah@yorku.ca](mailto:easempah@yorku.ca)

Purpose of the Study: To explore the priority setting and policymaking environment within which HPV vaccine access and uptake in Ghana operates and how the policy instruments that are in place limit (engage) or delimit (disengage) the determinants (factors) of health inequality or inequity as far as right to health is concern.

Why you are asked to complete this survey: To determine your awareness of HPV and HPV vaccination and understand your views of government actions/inactions in preventing or controlling cervical cancer in your country. You may skip any questions you do not want to answer.

Risks and Discomforts: I understand that topics such as cancer and vaccination may be sensitive to some people and therefore present some psychological risk. If you are not comfortable to answer questions that raises/mentions these topics, you have the right to skip or not to answer any questions at all and opt not to continue with the survey. Also, you will be fully anonymous, and any information provided will be protected from public traceability.

Confidentiality: Confidentiality will fully be provided. Your name will not appear in any report or publication of the research. Research data will be stored for a minimum period of two years, after which it will be destroyed through permanently deleting the Google Form account created by 30th September 2024.

Disclaimer: The researcher(s) acknowledge that the host of the online survey (google) may automatically collect participant data without their knowledge (i.e., IP addresses.) Although this information may be provided or made accessible to the researchers, it will not be used or saved without participant's consent on the researcher's system. Further, "Because this project employs e-based collection techniques, data may be subject to access by third parties as a result of various security legislation now in place in many countries and thus the confidentiality and privacy of data cannot be guaranteed during web-based transmission."

Questions About the Research? If you have questions about the research in general or about your role in the study, please feel free to contact me at [easempah@yorku.ca](mailto:easempah@yorku.ca) or my supervisor, Prof. Mary E. Wiktorowicz at [mwiktor@yorku.ca](mailto:mwiktor@yorku.ca) and/or 416 736 2100 Ext. 22124. You may also contact the Graduate Program in Health at [gradhlth@yorku.ca](mailto:gradhlth@yorku.ca) and/or (416) 736-2100 Ext. 44494.

This research has been reviewed and approved by the Faculty of Health Research Committee, on behalf of York University, and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Research Tower, York University (telephone 416-736-5914 or e-mail [ore@yorku.ca](mailto:ore@yorku.ca)).

Consent: By answering and submitting this online survey form, you are indicating that you consent to

participate in the research titled “HPV Vaccine Access and Cervical Cancer Policy-Making Process: A Comparative Governmental Priority Setting Study of Ghana, Rwanda, and

Canada” conducted by Eric Asempah., that you have understood the nature of this project and wish to participate. You are not waiving any of your legal rights by submitting this online form.

### Google Form Survey Questions

---

\* Required

1. Email \*

2. First Name \*

3. Country \*

Which country are you filling this form from

- Ghana
- Rwanda
- Canada
- other

4. Gender \*

- Male
- Female
- Other

5. Age Range \*

- 18-25
- 26-35
- 36- up

## 6. Highest Educational Level \*

- None
- Primary
- Junior High School
- Senior High School
- Vocational University
- Other
- 

## 7. Employment \*

- Private Organization
- Government Institution
- Self Employed
- Student
- Unemployed
- Other

## 8. Age of debut sexual experience

- Not Yet
- <17
- >17-26
- 27+
- Prefer not to answer

## 9. Are you aware or have you heard of HPV?

- Yes
- No

10. If you have answered YES, how did you hear about HPV?

- Self-Reading
- National Education Program
- Government owned TV Station
- Privately owned TV Station
- Government owned Radio Station
- Privately owned Radio Station
- Internet
- School
- Other



11. Do you know whether HPV infection can be spread through sex or not?

- Yes
- No
- Maybe

12. Do you know some type of HPV can cause cervical cancer?

- Yes
- No
- Maybe

13. Are you aware there is a vaccine against the type of HPV that can cause cervical cancer?

- Yes
- No
- Maybe

14. Has your country introduced HPV vaccination yet?

- Yes
- No
- I don't know

15. If your country has introduced the HPV vaccine, have you taken the shot yet?

- Yes
- No
-

Yes

No

16. If you have not taken the HPV vaccine yet, will you be willing to take the shot when your country introduces it?

Yes

No

Maybe

17. If your country has not introduced the HPV vaccine yet, do you think the government will introduce it at some point?

Yes

No

Maybe

18. Do you think the government has the resource to conduct a national HPV vaccination for those who need it?

Yes

No

Maybe

19. Is the government effort to educate the public on HPV related cervical cancer adequate?

- Yes  
 No  
 Maybe

20. Are you aware if your country has any specific policy on cervical cancer prevention and control?

- Yes  
 No

21. Is the government committed to prioritizing cervical cancer prevention in your country?

- Yes  
 No  
 Maybe

22. Do you think women's health is a priority to the government?

- yes  
 No  
 maybe

---

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## Appendix 5: Sample interview questions

### SAMPLE INTERVIEW QUESTIONS

Politicians/ Decision Makers/Government	
Q: Can you describe the public health policymaking approach in your country?	A
Q: Who are the key players or stakeholders in vaccine policymaking process in your country?	A
Q: Are there donors /funders for vaccine in your country? If so, who are they and how do they influence vaccination policy?	A
Q: Do you have any idea on how vaccine purchase negotiation is done in your country? If yes, can you describe how the negotiation happens?	A
Q: What strategy (if any) does the government utilize in vaccine purchasing negotiation? <i>Example: negotiate with vaccine manufacturer, negotiate through GAVI, negotiate through other stakeholders, etc.</i>	A
Q: How transparent is vaccine negotiation in your country?	A
Q: Do you know how much of the country's GDP is spent on healthcare?	A
Q Does a particular committee review such proposals? How are priorities determined?	A
Q: Is the media influential in vaccination uptake in your country? If so, which means are used and which ones have been effective in your opinion, and why you think so?	A

**Politicians/ Decision Makers/Government**

Q: In your opinion, is cervical cancer given adequate governmental attention/priority? Could you kindly provide some explanation for your answer? How are priorities determined?

A

Q: Women's Health, Men's Health and Children's Health, which of these is given greater attention in your country and why this is so?

A

Q: Is there a policy or program that aims to prevent and control Cervical Cancer? Could you kindly provide some explanation to your answer (if policy or program is available, kindly indicate if it is robust or not)?

A

Q: Considering other public health priorities, what level of priority do you think HPV vaccination should be given within your country's public health priority needs? Kindly explain your position

A

Q: Should HPV Vaccination for adolescent (for example) be a priority for the government? Can you kindly explain this answer?

A

Q: Who are the key stakeholders who have the power to influence HPV vaccination in your country and how have their power been used to influence policy on HPV vaccination and cervical cancer prevention?

A

Q: Can you explain how citizens in your country demand right to health from the government or have done so in the past?

A

**Health Professionals (e.g., Physicians) / Ministry of Health**

Q: What is your general view on HPV associated cervical cancer in your country?

A

Q: What is the general view of the population to be vaccinated?

A

Q: Is the media influential in vaccination uptake in your country? If so, which means are used and which ones have been effective in your opinion, and why you think so?

A

Q: In your opinion, is cervical cancer given adequate governmental attention/priority? Could you kindly provide some explanation for your answer?

A

Q: Are there donors /funders for vaccine in your country? If so, who are they and how do they influence vaccination policy?

A

Q: Do you know how much of the country's GDP is spent on healthcare?

A

Q: Do you think the government has the financial capacity to cover HPV vaccines and vaccination program in the country?

A

Q: Women's Health, Men's Health and Children's Health, which of these is given greater attention in your country and why this is so?

A

Q: Is there a policy or program that aims to prevent and control Cervical Cancer? (if policy or program is available, kindly indicate if it is robust or not)?

A

Q: considering other public health priorities, what level of priority do you think HPV vaccination should be given within your country's public health priority needs? Kindly explain your position

A

**Academia / Technical Experts**

Q: What is your general view on HPV associated cervical cancer in your country?

A

Q: Who are the key players or stakeholders in vaccine policymaking process in your country?

A

Q: Are there donors /funders for vaccine in your country? If so, who are they and how do they influence vaccination policy?

A

Q: do you have any idea on how vaccine purchase negotiation is done in your country? If yes, can you describe how the negotiation happens?

A

Q: What strategy (if any) does the government utilize in vaccine purchasing negotiation?

Example: negotiate with vaccine manufacturer, negotiate through GAVI, negotiate through other stakeholders, etc.

A

Q: How transparent is vaccine negotiation in your country?

A

Q: Is the media influential in vaccination uptake in your country? If so, which means are used and which ones have been effective in your opinion, and why you think so?

A

Q: In your opinion, is cervical cancer given adequate governmental attention/priority? Could you kindly provide some explanation for your answer?

A

Q: Should HPV Vaccination for adolescent (for example) be a priority for the government? Can you kindly explain this answer?

A

Q: Can you explain how citizens in your country demand right to health from the government or have done so in the past?

A

**Population Health Advocacy Groups/NGOs/ Women's Groups**

Q: What is your general view on HPV associated cervical cancer in your country?

A

Q: Is the media influential in vaccination uptake in your country? If so, which means are used and which ones have been effective in your opinion, and why you think so?

A

Q: In your opinion, is cervical cancer given adequate governmental attention/priority? Could you kindly provide some explanation for your answer?

A

Q: Should HPV Vaccination for adolescent (for example) be a priority for the government? Can you kindly explain this answer?

A

Q: Who are the key stakeholders who have the power to influence HPV vaccination in your country and how have their power been used to influence policy on HPV vaccination and cervical cancer prevention?

A

Q: Can you explain how citizens in your country demand right to health from the government or have done so in the past?

A



## Appendix 6: Interview Strategy

DURATION IN MINUTES	RESEARCH INTERVIEWING TASK		
<b>15</b>	<b>INTRODUCTION (Housekeeping)</b>		<b>RATIONALE (To)</b>
1	✓ Greet and thank participant for her/his time		1. Create Rapport with Interviewee and establish connection during the interviewing process.  2. Ensure all documents are signed and the interviewee understands the objective of the interview.  3. Collect signed inform consent form prior to starting the interviewing process.
2	✓ Disseminate Research Consent form and explain it to the participant		
1	✓ Welcome Participant and Introduce self to participant		
1	✓ Allow Participant to Introduce herself or himself		
1	✓ State the Research Problem to the Participant		
2	✓ State the Research Objectives to Participant		
3	✓ Explain to Participant the Interview Process		
2	✓ Explain to Participant the Ethical Protocols of the Research		
2	✓ Explain to Participant their rights during the interview process and Assurance that their information will be held in high Confidentiality		
<b>50</b>	<b>INTERVIEW QUESTION</b>	<b>PROBE</b>	
8	What is your general view on HPV associated cervical cancer in your country?	Do you think people have been educated enough on HPV associated Cervical cancer?	General Perspective in HPV Associated Cervical Cancer
8	In your opinion, is cervical cancer given adequate governmental attention/priority? Could you kindly provide some explanation for your answer?	Should HPV Vaccination for adolescent (for example) be a priority for the government? Can you kindly explain your position/answer?	Governmental priority and agenda settings for HPV vaccine uptake and policy/program
10	Can you describe the public health policymaking approach in your country?	Is health equity built in the policymaking process?	Health policy points of convergence and/or divergence
8	Who are the key players or stakeholders in vaccine policymaking process in your country?	Is the media influential in vaccination uptake in your country? If so, which means are used and which ones have been effective in your opinion, and why you think so?	Core actors inside and outside of government
8	What process is normally followed to introduce a new vaccine or new therapy for coverage? Does a particular committee review such proposals? How are priorities determined?	What strategy (if any) does the government utilize in vaccine purchasing negotiation? Example: negotiation with vaccine manufacturer, negotiate through GAVI, negotiate through other stakeholders, etc. How transparent is vaccine negotiation in your country? What is the general view of the population to be vaccinated?	Actor's level of influence in HPV vaccine access, Availability, and Population Acceptability of Vaccine
8	Can you explain how citizens in your country demand right to health from the government or have done so in the past?	Are human rights ideals prominent in Public Health in your country?	Governments Actions leading to health equity or inequity

### Appendix 7: Post interview log form

LIST OF INTERVIEWEES

<b>Country: E.g., Ghana</b>					
<b>Data</b>	<b>Type and Interviewing Location</b>	<b>Institution</b>	<b>Level at Institution</b>	<b>Date and Time of Interview</b>	<b>Review of Interviewee</b>
<b>First name plus last name Initial</b> E.g., Eric Asempah becomes Eric A.	<ul style="list-style-type: none"><li>▪ Interview</li><li>▪ Group Interview</li><li>▪ Telephone Interview</li><li>▪ Email Response to interview questions</li><li>▪ VOIP e.g., Zoom</li></ul>	<b>Name of organization worked for if applicable</b>	<b>Position</b>	<b>Day/Month/Year-Time in 12-hour format.</b> E.g.: 04/12/2021-03:30pm	<ul style="list-style-type: none"><li>▪ Receptive</li><li>▪ Confrontation</li><li>▪ Cooperation</li><li>▪ Uncertain</li><li>▪ Disunity</li><li>▪ Unity</li><li>▪ Congenial</li></ul>

## Appendix 8: Ghana: SPSS Statistical Analysis for Survey Results

**TABLE 1: PRIMARY INFORMATION**

		Male	Female	Frequency	Percent	Valid Percent	Cumulative Percent
<b>Gender</b>							
Valid	Male			64	31.8	31.8	31.8
	Female			137	68.2	68.2	100.0
	Total			201	100.0	100.0	
<b>Age Range</b>							
Valid	18-25	6	5	11	5.5	5.5	5.5
	26-35	16	77	93	46.3	46.3	51.7
	36- up	42	55	97	48.3	48.3	100.0
	Total	64	137	201	100.0	100.0	
<b>Education</b>							
Valid	Junior High School	1	1	2	1.0	1.0	1.0
	Senior High School	2	0	3	1.5	1.5	2.5
	Vocational	1	1	2	1.0	1.0	3.5
	University	53	111	164	81.6	81.6	85.1
	Other	6	24	30	14.9	14.9	100.0
	Total	63	137	201	100.0	100.0	
<b>Age of Debut Sex</b>							
Valid	Not Yet	5	5	10	5.0	5.1	5.1
	<17	4	10	14	7.0	7.1	12.1
	>17-26	30	59	89	44.3	44.9	57.1
	27+	14	36	50	24.9	25.3	82.3
	Prefer not to answer	11	24	35	17.4	17.7	100.0
	Total	64	134	198	98.5	100.0	
Missing	System			3	1.5		
Total				201	100.0		

**TABLE 2: HPV AWARENESS**

		Male	Female	Frequency	Percent	Valid Percent	Cumulative Percent
<b>Are you aware or have you heard of HPV?</b>							
Valid	Yes	38	125	163	81.1	81.5	81.5
	No	26	11	37	18.4	18.5	100.0
	Total	64	136	200	99.5	100.0	
Missing	System			1	0.5		
Total				201	100.0		
<b>If you have answered YES, how did you hear about HPV?</b>							
Valid	Self Reading	11	21	32	15.9	19.4	19.4
	National Education Program	3	16	19	9.5	11.5	30.9
	Government owned TV Station	1	2	2	1.0	1.2	32.1
	Privately owned TV Station		1	1	0.5	0.6	32.7
	Government owned Radio Station		1	1	0.5	0.6	33.3
	Privately owned Radio Station	9	17	26	12.9	15.8	49.1
	Internet	8	19	27	13.4	16.4	65.5
	School	1	47	57	28.4	34.5	100.0
	Total			165	82.1	100.0	
Missing	System			36	17.9		
Total				201	100.0		
<b>Do you know whether HPV infection can be spread through sex or not?</b>							
Valid	Yes	38	116	154	76.6	76.6	76.6
	No	24	15	39	19.4	19.4	96.0
	Maybe	2	6	8	4.0	4.0	100.0
	Total	64	137	201	100.0	100.0	

**TABLE 3: PREDICTABILITY OF HPV VACCINE HESITANCY**

		Male	Female	Frequency	Percent	Valid Percent	Cumulative Percent
<b>If your country has introduced the HPV vaccine, have you taken the shot yet?</b>							
Valid	Yes	1	13	14	7.0	8.3	8.3
	No	49	105	154	76.6	91.7	100.0
	Total	50	118	168	83.6	100.0	
Missing	System			33	16.4		
<b>Total</b>				201	100.0		
<b>If you have not taken the HPV vaccine yet, will you be willing to take the shot when your country introduces it?</b>							
Valid	Yes	26	103	129	64.2	70.9	70.9
	No	10	9	19	9.5	10.4	81.3
	Maybe	21	13	34	16.9	18.7	100.0
	Total	57	125	182	90.5	100.0	
Missing	System			19	9.5		
<b>Total</b>				201	100.0		

**TABLE 4: GOVERNMENT PRIORITY SETTING AND RESOURCE ALLOCATION**

		Male	Female	Frequency	Percent	Valid Percent	Cumulative Percent
<b>Do you think the government will introduce HPV Vaccine at some point?</b>							
Valid	Yes	15	48	63	31.3	36.8	36.8
	No	5	9	14	7.0	8.2	45.0
	Maybe	38	56	94	46.8	55.0	100.0
	Total	58	113	171	85.1	100.0	
Missing	System			30	14.9		
<b>Total</b>				201	100.0		
<b>Do you think the government has the resource to conduct a national HPV vaccination for those who need it?</b>							
Valid	Yes	29	54	83	41.3	41.3	41.3
	No	14	42	56	27.9	27.9	69.2
	Maybe	21	41	62	30.8	30.8	100.0
	Total	64	137	201	100.0	100.0	
<b>Is the government effort to educate the public on HPV related cervical cancer adequate?</b>							
Valid	Yes	6	20	26	12.9	13.0	13.0
	No	43	100	143	71.1	71.5	84.5
	Maybe	17	14	31	15.4	15.5	100.0
	Total	66	134	200	99.5	100.0	
Missing	System			1	0.5		
<b>Total</b>				201	100.0		
<b>Are you aware if your country has any specific policy on cervical cancer prevention and control?</b>							
Valid	Yes	18	57	75	37.3	37.7	37.7
	No	46	78	124	61.7	62.3	100.0
	Total	64	135	199	99.0	100.0	
Missing	System			2	1.0		
<b>Total</b>				201	100.0		
<b>Is the government committed to prioritizing cervical cancer prevention in your country?</b>							

		Male	Female	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	31	47	49	24.4	24.5	24.5
	No	15	45	92	45.8	46.0	70.5
	Maybe	18	45	59	29.4	29.5	100.0
	Total	64	137	200	99.5	100.0	
Missing	System			1	0.5		
Total				201	100.0		
Do you think women's health is a priority to the government?				Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	31	47	78	38.8	38.8	38.8
	No	15	45	60	29.9	29.9	68.7
	Maybe	18	45	63	31.3	31.3	100.0
	Total	64	137	201	100.0	100.0	

**TABLE 5: KNOWLEDGE OF POLICY ON CERVICAL CANCER PREVENTION AND CONTROL**

		Male	Female	Frequency	Percent	Valid Percent	Cumulative Percent
Are you aware if your country has any specific policy on cervical cancer prevention and control?							
Valid	Yes	18	57	75	37.3	37.7	37.7
	No	46	78	124	61.7	62.3	100.0
	Total	64	135	199	99.0	100.0	
Missing	System			2	1.0		
Total				201	100.0		

**TABLE 6: RIGHT TO HEATH**

		Male	Female	Frequency	Percent	Valid Percent	Cumulative Percent
Have you ever demanded your right to heath at any time in your life in your country?							
Valid	Yes	29	65	91	45.3	45.7	45.7
	No	35	73	108	53.7	54.3	100.0
	Total	64	138	199	99.0	100.0	
Missing	System			2	1.0		
Total				201	100.0		

**TABLE 7: SUMMARY OF CHI-SQUARE TEST RESULTS**

Cross Tabulation	Phi Coefficient	P-Value
Highest Education Level * Government commitment to cervical cancer prevention	0.303	0.190
Highest Education Level * Awareness of cervical cancer prevention	0.389	0.000
Highest Education Level * Awareness of HPV Vaccine	0.368	0.01
Highest Education Level * Willingness to be Vaccinated	0.251	0.178
Highest Education Level * Policy on cervical cancer Prevention and Control	0.17	0.219
Highest Education Level * Government Resources for HPV vaccination Control	0.209	0.360
Highest Education Level * Right to health Control	0.117	0.606
Age of debut sex * Aware of HPV related cervical cancer	2.71	0.070
Gender * Medium of HPV awareness cancer	0.284	0.64
Gender * Willingness to be vaccinated	0.379	0.000
Government Commitment to Cervical cancer prevention * Public Education on HPV related cervical cancer	0.515	0.000
Women health prioritization * Government commitment to cervical cancer prevention	0.666	0.000
Women health prioritization * Policy on cervical cancer prevention and control	0.272	0.001
Gender * Right to health cancer	-0.006	0.935
Age range * Right to health cancer	0.36	0.878
Highest education level * Right to health cancer	0.117	0.606
Employment * Right to health cancer	0.22	0.870
Age of debut sex * Right to health cancer	0.161	0.278
Women health prioritization * Right to health	0.301	0.000

Results obtained from SPSS descriptive statistics

TABLE 8: GHANA: NVIVO THEMES GENERATION FOR INTERVIEW <sup>26</sup>

Code Names	Description	Files	References
<b>AWARENESS</b>	<b>Participants Awareness of HPV and HPV Related cervical cancer</b>	<b>5</b>	<b>10</b>
Low Awareness	Awareness Level	1	1
Cervical Cancer	Knowledge of Cervical Cancer and Relation to HPV	2	3
Training	Training for Healthcare Professionals	1	2
Direction for prevention	Approach to preventing HPV-Related Cervical Cancer	1	4
HPV Infections	HPV Infections and Cervical Cancer Prevalence	1	1
Education	Public Education on HPV-Related Cervical Cancer	3	3
National Vaccination Program	Plans towards National HPV Vaccination program	2	9
<b>Media Influence in Vaccine uptake</b>	<b>Media Influence in Vaccine Uptake in Ghana</b>	<b>7</b>	<b>11</b>
Prevention	Prevention of cervical cancer in Ghana	5	6
Screening	Women screening for cervical cancer	3	5
Vaccination	Vaccination regime in Ghana	3	8
Vaccine Dose	HPV doses	1	2
Vaccines	HPV Vaccines availability	1	3
<b>POLICYMAKING</b>	<b>Policymaking process towards cervical cancer prevention and control</b>	<b>3</b>	<b>9</b>
Policy	Policy in place to prevent and control cervical cancer	5	6
Prevalence	Cervical cancer prevalence in Ghana	2	7
Screening	Women screening for cervical cancer	3	5
Prevention	Prevention of cervical cancer in Ghana	5	6
Primary Prevention	Primary prevention of cervical cancer	1	2
Secondary Prevention	Available secondary prevention against cervical cancer	1	1
Stakeholders' vaccine policy	What vaccine policy is in place	5	9
<b>PRIORITY SETTING</b>	<b>How dedicated is the government to prevent cervical cancer</b>	<b>7</b>	<b>16</b>
Negative outlook	How is cervical cancer perceived	2	2
Vaccines	HPV vaccine availability	1	3
Vaccination Prioritization	Core vaccine priority areas	2	3
vaccine purchase negotiation	Vaccine purchase negotiation strategies	2	4
Vaccine comparative pricing	Vaccine procurement strategies	1	1
Women's health prioritization	Prioritization of women's health in Ghana	4	6
Children's Health prioritize over women	Comparing Women's Health priority to Children	1	1
<b>RESOURCE ALLOCATION</b>	<b>How much of healthcare resource is allocated to cervical cancer</b>	<b>4</b>	<b>7</b>
Donors	Donors towards HPV-Related Cervical Cancer Prevention	5	8
Funding	Funding Potentials towards HPV-Related Cervical Cancer	2	4
Healthcare Expenditure	Resource Allocation and Government Priority Setting	3	3
<b>RIGHT TO HEALTH</b>	<b>How the public demand right to health</b>	<b>3</b>	<b>7</b>
Health Equity	Health Equity among gender lines	1	1

<sup>26</sup> Themes generated are in bold.

### Appendix 9: Actor-interest and allocation of power/influence in HPV policymaking

	CANADA		RWANDA		GHANA	
	interest	power	interest	power	interest	power
Government	5	5	5	5	3	5
Pharmaceutical/Biologics Company	5	3	5	3	1	3
Non-Profit Health Organization	1	1	3	3	3	3
Physicians (or Association)	3	2	3	3	3	2
International Donor Organization (e.g., Gavi)	1	1	4	3	3	2
Academia	4	2	4	3	3	2
Media	3	3	3	3	3	3
Policy Entrepreneurs	5	3	5	4	1	1
Marker: 1=very low, 2=low, 3=medium, 4=high, 5=very high						



Appendix 10: Poster Certificate for thesis chapter presentation

**IPVC** 2023

35<sup>TH</sup> INTERNATIONAL  
PAPILLOMAVIRUS CONFERENCE

Coming Together for HPV Elimination

APRIL 17-21, 2023 | WASHINGTON D.C., USA  
IN-PERSON & ONLINE



# Poster Certificate

This is to certify that:  
**Eric Asempah**

Presented Poster Presentation entitled:

**IMPERATIVES FOR NATIONWIDE HPV VACCINATION PROGRAM  
FOR CERVICAL CANCER PREVENTION IN GHANA**

**Co-Authors**

Eric Asempah (Canada)

at the:

35<sup>th</sup> International Papillomavirus Conference (IPVC 2023)

Washington D.C., USA

April 17-21, 2023

Prof. Suzanne Garland  
Co-Chair

Prof. Toshiyuki Sasagawa  
Co-Chair

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