

Field Epidemiology Training Program

Cancer Curriculum: Principles of Cancer Screening Programs

**Case Study:
Establishing and Expanding a
Cancer Screening Program in
Zimbabwe**

FACILITATOR GUIDE



Overview

Participants will apply what they learned in Module 4: *Principles of Cancer Screening Programs* to the issue of cervical cancer prevention in Zimbabwe. Participants will work in small groups as instructed by the Facilitator.

Objectives

At the end of this exercise, participants should be able to:

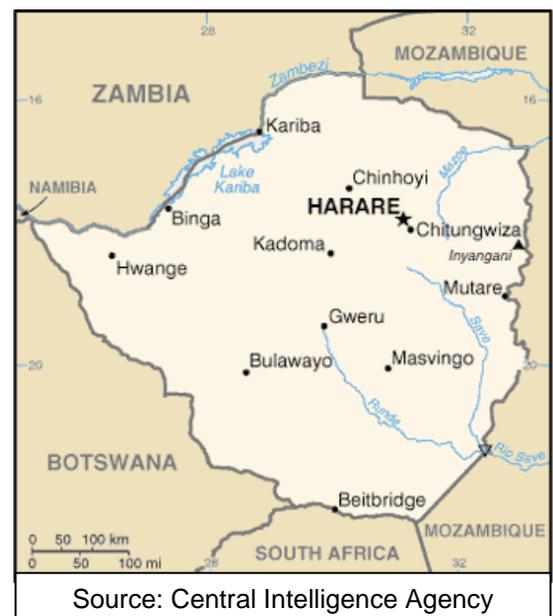
- Learn the various data sources that can be used to examine cancer burden on a national level
- Work through a sample scenario from Zimbabwe to assess the impact of socioeconomic determinants on women's knowledge of cervical cancer and cervical cancer screening in Zimbabwe
- Understand how different information from population-based surveys and patient medical records can be used to evaluate cervical cancer screening efforts, and discuss the utility of epidemiological data for public health action

Scenario

Zimbabwe's cancer prevention and control program is largely underfunded. However, there is a growing support from a few partnerships to support cancer prevention and control efforts in Zimbabwe. You have been working on cervical cancer prevention programs around the world and have recently been hired by the Zimbabwean government to examine existing data on cervical cancer screening in Zimbabwe and provide an evaluation of current screening efforts. You were asked by the government to assess the impact of socioeconomic determinants on women's knowledge of cervical cancer and cervical cancer screening. Given the limited resources for cancer prevention and control in Zimbabwe, you need to present a convincing argument to justify which screening cervical cancer screening strategy and factors to consider in expanding the cervical cancer screening program in Zimbabwe. You will present a summary of key findings to the government of Zimbabwe and key stakeholders.

Background

Zimbabwe is a low-income country and has a population of about 14 million, with 33% of the population living in urban areas. Zimbabwe's population is relatively young, 60% of the population is below the age 25 years, and only 3% is 65 years or older. Over the past two decades, life expectancy has increased in Zimbabwe from 48 years in 1996 to 59 years in 2015. Between 2001 and 2015, Zimbabwe spent 2.5% of its gross domestic product on health. The burden of cancer is increasing in Zimbabwe due to population growth and aging. Although many cancers are not captured by the routine National Health Information System because the patients do not present for treatment or register deaths, those who do report are usually at an advanced stage of disease, and have limited access to screening services. The current cancer treatment and palliation services are unable to meet the existing demand. Additionally, and despite great



progress in reducing HIV prevalence in recent years, the prevalence of HIV in Zimbabwe remains one of the highest in the world; this is a challenge for cervical cancer control efforts since HIV-positive women are more likely to have persistent HPV infections than HIV-negative women. To address the rising cancer burden, a National Cancer Prevention and Control Strategy was developed to focus on the reform and reorganization of the way cancer services are delivered in Zimbabwe, in order to ensure that future services are consistent and associated with good clinical outcomes for all cancer patients and quality care for the patients and their care givers.

Instructions

We have 90 minutes to work through this case. Review the background material (provided in your guide). Work in groups to answer the questions in your guide and follow the steps to:

- Understand the burden of cancer
- Evaluate the uptake of cervical cancer screening
- Make the case of how funds should be allocated

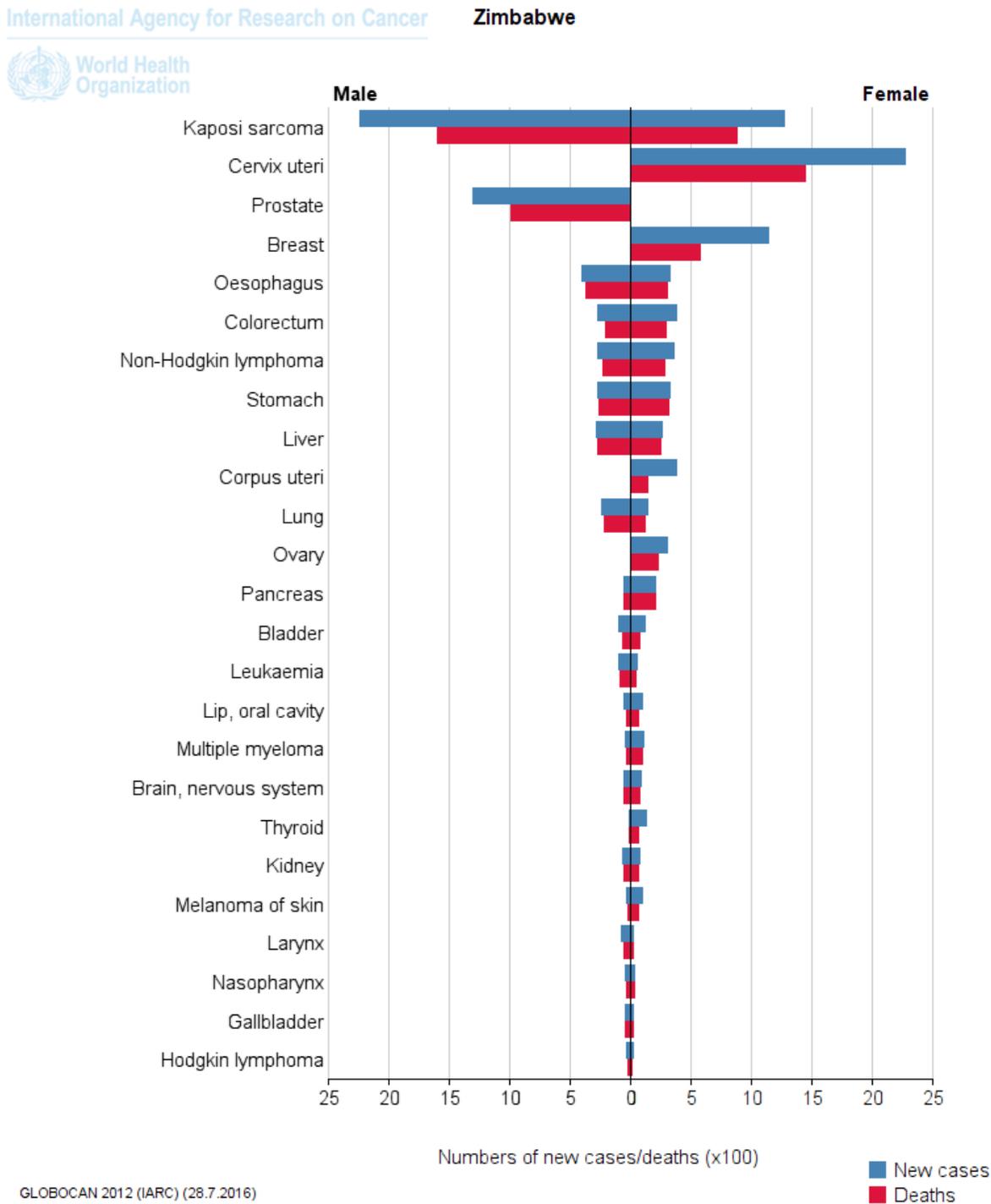
Required readings for the related to the Uganda Cancer Registry include:

- Annex 1: Country Capacity (pages 7-9 of this guide)
- Annex 2: Bruni L, Barrionuevo-Rosas L, Albero G, Serrano B, Mena M, Gómez D, Muñoz J, Bosch FX, de Sanjosé S. ICO Information Centre on HPV and Cancer (HPV Information Centre). Human Papillomavirus and Related Diseases in Zimbabwe. Fact Sheet 2017. Available from <http://www.hpvcentre.net/summaryreport.php>. Accessed 5/22/2017.
- Fallala MS, Mash R. Cervical cancer screening: Safety, acceptability, and feasibility of a single-visit approach in Bulawayo, Zimbabwe. *Afr J Prim Health Care Fam Med*. 2015 May 5;7(1). doi: 10.4102/phcfm.v7i1.742.

Optional readings:

- Nyakabau, AM. "Priorities for cancer prevention and control in Zimbabwe." *Cancer Control*, June 25 (2014). Available from <http://www.cancercontrol.info/wp-content/uploads/2014/08/126-130-Nyakabao.pdf>

Figure 1. Estimated cancer incidence and mortality in Zimbabwe in 2012



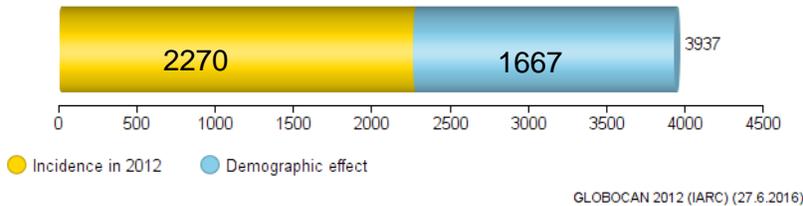
- Cancers related to infectious agents (Kaposi sarcoma, cervix, stomach, liver) are among the leading types of cancer related morbidity and mortality in both sexes in Zimbabwe
- Lung, breast, colorectal and prostate cancer are also common causes of cancer morbidity and mortality in Zimbabwe

Figure 2. Estimated increase in (a) incidence and (b) mortality from cervical cancer in Zimbabwe by the year 2030

International Agency for Research on Cancer



Zimbabwe
 Cervix uteri
 Number of new cancers in 2030 (all ages)

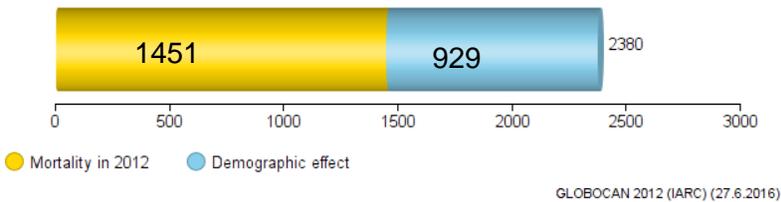


- Cervical cancer was the leading cancer diagnosis and cause of cancer-related deaths among women in 2012.

International Agency for Research on Cancer



Zimbabwe
 Cervix uteri
 Number of cancer deaths in 2030 (all ages)



- GLOBOCAN projections indicate that the burden of cervical cancer will increase by 65% to 75% by the year 2030 due to demographic changes

GLOBOCAN Methods

Data sources and methods (summary) - Indices of quality (C6)

Incidence

Data: high quality regional (coverage lower than 10%).

Method: estimated as the weighted average of the local rates.

Mortality

Data: no data.

Method: estimated from national incidence estimates using modelled survival.

Methods (detailed)

Incidence

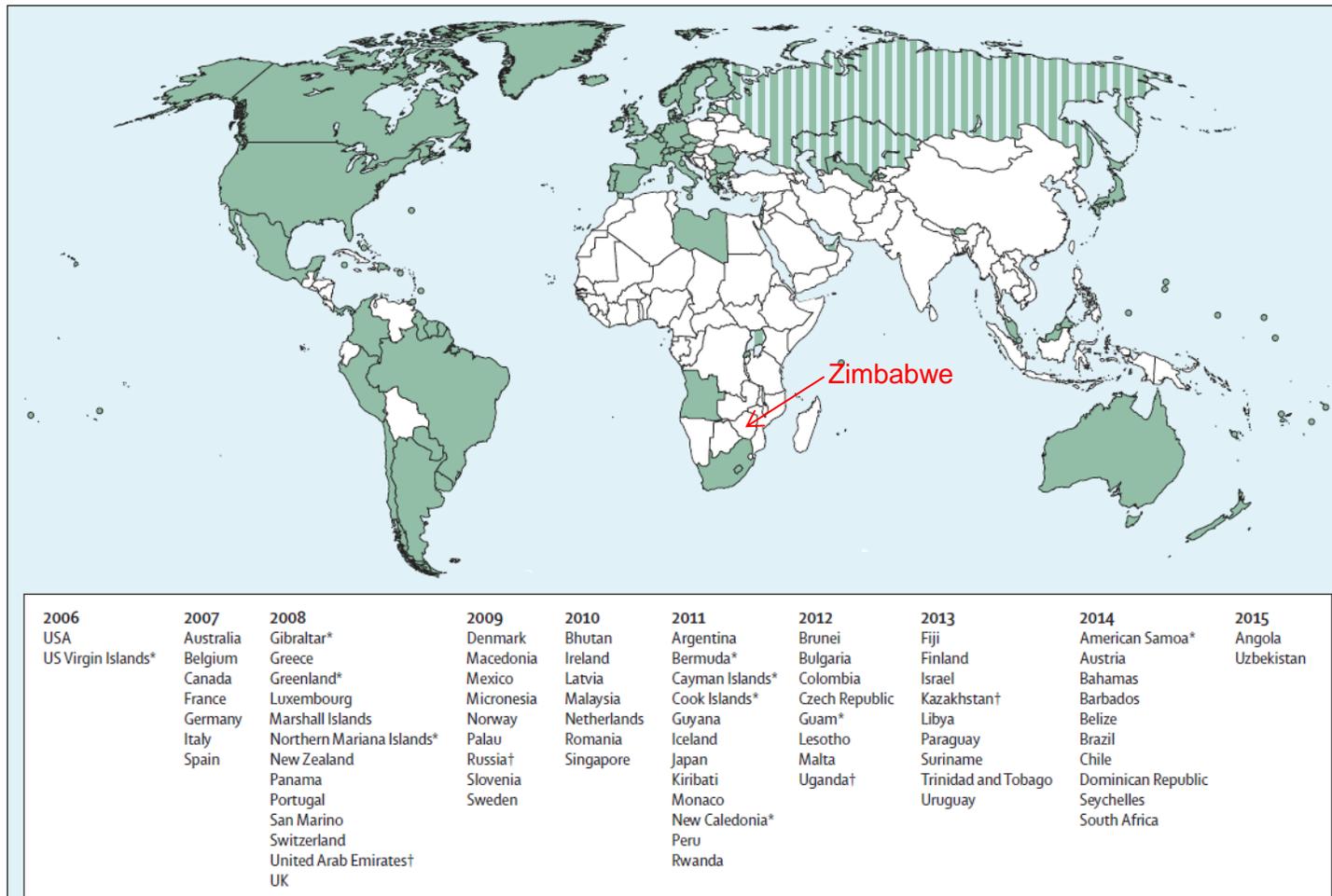
Weighted average of the rates from:

1. Bulawayo Cancer Registry (2000-2001)
2. Harare Cancer Registry (2009-2011), black population

Mortality

Estimated from estimated national cancer incidence for 2012 and modelled survival.

Figure 4: Countries that have introduced a publicly funded national human papillomavirus vaccination program since 2006



Currently Zimbabwe, has not introduced a publicly funded national HPV vaccination program

Striped sections indicate implementation in a part of the country. French Polynesia, Liechtenstein, and Niue have reported vaccine programs, but no information was available about year of introduction. *Special territory. †Partial implementation.

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Annex 1: Country Capacity

National Cancer Prevention and Control Strategy for Zimbabwe 2013-2017

Source: Zimbabwe Ministry of Health and Child Welfare. The National Cancer Prevention And Control Strategy For Zimbabwe 2013 - 2017. Available from <http://www.iccp-portal.org/sites/default/files/plans/CANCER%20STRATEGY%20FINAL%202013%202017.pdf>. Accessed April 2016.

Availability of diagnostic services for cancer:

- Plain X-rays: taken at district, provincial or central hospitals
- Biopsy: Provincial and Central hospitals and few mission hospitals
- Cytology: very limited but offered by private laboratories at a cost
- Computerized Tomography (CT) scanning is available in Harare and Bulawayo.
- The private sector offers CTs at reasonable service at a cost.
- Public facilities for CT scanning are inadequate and non-functional most of the time.
- Mammography is available in private institutions and recently one machine has been installed and commissioned in the government sector at Parirenyatwa Hospital
- Magnetic Resonance Imaging (MRI): available in private institutions (very expensive)
- Brachytherapy equipment for gynaecological cancers: Mpilo Hospital and Parirenyatwa Hospital (new acquisition).

Availability of treatment services for cancer:

- Pharmacies: Parirenyatwa and Mpilo Hospitals
- Chemotherapy drugs are expensive and are not always available there.
- Patients who are prescribed chemotherapy medications must try to obtain them at private pharmacies
- In pediatrics, chemotherapy drugs are mainly supplied by Kidzcan.

Diagnostic radiology

- Most district, provincial and central hospitals are currently unable to provide diagnostic radiology services (non-functional old equipment and human resource shortage)
- Computerized Tomography (CT) scanning: used to be available in the public sector in Harare and Bulawayo. Public facilities for CT are inadequate and have been non-functional for several years.
- One mammography unit has been recently installed and commissioned in the public sector at Parirenyatwa Hospital.
- Magnetic Resonance Imaging (MRI) has not been available for several years due to equipment breakdown.
- Private sector offers diagnostic radiology services at a cost. There are a number of these centers in the major cities of the country

Pathology services

- Basic laboratory services are available in the District Hospitals, Mission Hospitals and some small private centers.
- Histopathology services are centralized to the towns of Harare and Bulawayo in both the private and public sectors.
- There are five pathologists for the whole country (4 in Harare and 1 in Bulawayo).
- The ideal number of pathologists is 1 for every 250,000 of the population.

Nuclear Medicine

- **Equipment:**
 - Two State-owned nuclear medicine facilities: Parirenyatwa group of hospitals (with one non-functional Siemens E-cam gamma camera installed in 2003) and Mpilo Central Hospital (with one obsolete Sophy Gamma camera installed in the '90s).
 - Until late 2010 when the gamma camera broke down, some nuclear medicine studies were available at Parirenyatwa Group of Hospitals while at Mpilo, the facility has been non-functional since early 2003.
- **Personnel:**
 - One Nuclear Medicine Physician serving in Government attending to both Parirenyatwa and Mpilo Hospitals.
 - Two Nuclear medicine technologists: Parirenyatwa and Mpilo Central Hospital (recalled from retirement).
 - There are no medical physicists at the two nuclear medicine facilities (not in compliance with recommendations from the International Atomic Energy Agency, IAEA)

Radiotherapy

- **Equipment:**
 - Two National Radiotherapy Centers: Parirenyatwa Group of Hospitals in Harare and Mpilo Central Hospital in Bulawayo.
 - The Mpilo radiotherapy facility has not offered any services since 2003.
 - All of the cancers are treated at the centers except for some Kaposi's sarcoma (KS) patients that are seen at the KS clinic at Parirenyatwa Hospital.
- **Cost:**
 - Patients pay USD\$10 for consultation; this fee does not cover chemotherapy and radiotherapy. The centers themselves provide treatment services on an outpatient basis.
- **Facilities**
 - Two oncology wards, one for adults and one for children to accommodate the very sick patients.
 - A non-functional hostel (Tariro Hostel) used to house people who were waiting to be treated but not sick enough for admission at the Harare centre.
- **Personnel:**
 - 7 qualified Radiation Oncologists (6 are in Harare)
 - 4 Physicists
 - 16 Radiographers
 - 6 Nurses
 - There are no trained oncology nurses in the departments.
 - The IAEA recommends that there should be one oncologist for every 500,000 people in a population.
- **Cost:**
 - To access radiotherapy treatment centers in Harare or Bulawayo, patients must spend significant amounts of money, frequently beyond their reach

Surgery

- **Biopsies:** Provincial, Mission and Central hospitals.
- There is a lack of standardization of procedures carried out for the various cancers.

- There are no stand-alone surgical oncology units even at the tertiary level.
- Personnel:
 - One of the most well-staffed and older disciplines (no numbers provided)
 - Evidence-based cancer surgery need to be promoted
 - Surgical oncology units to be formed

Table A. Estimated human and resources required for screening a population of 1 million people provided with Pap smears

Category	Components	Pap smear with cytology
Test components	Persons screened	50,000
	Test per day per facility	50
	Facilities required (screening activities performed 5 days per week)	3
	Estimated number of positive tests †	7000
Human resources (dedicated to screening program)	Trained primary care professionals	20
	Health assistants	5
	Public health nurse	2
	Pathologists ††	1
	Surgeons	0.1
	Radiologists	0.1
Equipment and supplies	Colposcopes	4
Educational material and outreach	Community engagement	
	Community mechanisms	
	Clinical provider training	
Quality assurance measures	Monitoring and evaluation	
	Quality assurance	

† Assumes cervical cancer incidence of 25 per 100,000, specificity of 70%

†† A well trained pathologist can review 10,000 to 25,000 smears per year

Source: World Health Organization (2016) Guide to cancer early diagnosis and screening. In press.

Part I: Evaluating the Uptake of Cervical Cancer Screening

Learning points:

- *Understanding information that can be obtained from population- based surveys versus medical records for evaluating cervical cancer screening efforts*
- *Examine how data can be used to inform strategies to increase cervical cancer awareness*
- *Review of risk factors for cervical cancer and need for consideration of varying risk groups in implementing cervical cancer screening*
- *Identifying potential biases affecting cancer screening*

a. **Population-based surveys to evaluate cervical cancer screening**

High quality surveillance data are necessary to inform and evaluate national cervical cancer control programs and early detection efforts; however, these data are not yet available in many countries. Population based surveys including the Demographic and Health Surveys Program (DHS), supported by the United States Agency for International Development (USAID) and the World Health Organization's (WHO) STEPwise approach to non-communicable disease risk factor surveillance (STEPS) provide critical population-level data on cervical cancer screening coverage.

Use Table 1 "Knowledge and prevention of cervical cancer, Zimbabwe Demographic and Health Survey" to answer the following questions:

1. Describe the characteristics of women who responded to the survey and self-reported cervical cancer knowledge among respondents
 - a. *78.7% of the women interviewed reported ever hearing about cervical cancer screening while only 12.6 reported ever being screened for cervical cancer.*
 - b. *Similar proportion of women reported ever hearing about cervical cancer between provinces, ranging from 61.5% (in Matabeleland) to 90.8% (in Harare). In most provinces less than 12% of the women reported ever been screened for cervical cancer while in Harare and Bulawayo 21 to 24% reported had ever been screened for cervical cancer.*
 - c. *The majority of the women were between the ages 15-19 (22%) and 20-24 (17%) years. Most women lived in an rural setting (62%), were married (59%), had secondary education (66%), and were in the highest wealth quantiles (highest 26% and 23% 4th).*
2. Describe the socioeconomic characteristics of women in Zimbabwe who reported ever being screened for cervical cancer (either at 12 months or 3 years)
 - a. *Of the 1,250 women who reported ever been screened for cervical cancer, 66% were within the last 12 months and 90% were screened within the last 3-years.*
 - b. *Most of the women who were screened were between the ages of 30 and 34 years (25%), lived in an urban area (65%), were married (73%), had a secondary education (65%), and were in the highest wealth quantiles (45%).*

3. Are there any gaps in women's awareness about cervical cancer and cervical cancer screening in Zimbabwe, if so propose alternatives to fill the gaps
 - a. *The low percentage of women reporting ever being screened for cervical cancer suggest poor knowledge of the disease in Zimbabwe, which even cuts across different literacy levels and socioeconomic levels.*
 - b. *Gaps: Increases cervical cancer screening knowledge in Zimbabwe may depend on:*
 - *Raising awareness of cervical cancer and cervical cancer screening within the community, particularly in rural areas*
 - *Encouraging healthcare providers to advocate more efficiently about cervical cancer screening within patient's visits (i.e. prenatal care)*
 - *Young women (15-19 years) could be educated about the uptake of HPV vaccination as a preventive measure for cervical cancer*

Table 1. Knowledge and prevention of cervical cancer, Zimbabwe Demographic and Health Survey

Percentage of women age 15-49 who have ever heard of cervical cancer, have had a cervical screening (Pap test) ever or in the last 12 months and the last 3 years, by background characteristics, Zimbabwe 2015

Background characteristic	Have heard of cervical cancer	Have ever been screened for cervical cancer	Number of women	Among women who have had a cervical exam		Number of women
				Had cervical exam in the last 12 months	Had cervical exam in the last 3 years	
Age						
15-19	57.1	1.5	2,199	(82.9)	(97.0)	33
20-24	77.0	4.8	1,697	84.8	98.8	81
25-29	83.6	13.9	1,657	71.6	94.4	231
30-34	88.2	19.0	1,619	60.1	89.7	308
35-39	89.2	19.3	1,236	68.5	94.0	238
40-44	88.2	22.7	965	61.2	84.4	219
45-49	85.9	24.1	582	56.6	81.5	140
Residence						
Urban	88.4	21.1	3,829	64.9	89.2	806
Rural	72.6	7.2	6,126	67.5	92.3	444
Province						
Manicaland	73.4	6.4	1,266	52.5	84.2	80
Mashonaland Central	79.8	9.4	882	66.2	91.3	83
Mashonaland East	82.0	11.9	952	71.9	93.0	114
Mashonaland West	82.9	10.4	1,160	65.5	93.3	121
Matabeleland North	65.4	8.1	465	79.2	93.1	38
Matabeleland South	61.5	8.2	419	59.7	84.9	35
Midlands	72.6	8.4	1,263	66.6	90.6	106
Masvingo	73.0	10.5	1,187	74.8	94.1	125
Harare	90.8	23.9	1,783	65.9	88.5	426
Bulawayo	85.0	21.2	577	56.6	91.0	122
Marital status						
Never married	64.3	2.4	2,511	70.9	98.4	60
Married	83.2	16.0	5,841	64.0	89.3	932
Living together	83.8	10.2	310	(71.8)	(96.7)	31
Divorced/separated	83.9	16.3	855	69.5	91.0	139
Widowed	86.7	19.9	438	74.3	92.5	87
Education						
No education	59.2	8.9	126	*	*	11
Primary	66.4	7.5	2,571	71.4	88.9	192
Secondary	81.7	12.4	6,527	68.2	91.1	812
More than secondary	97.7	32.0	731	54.6	88.4	234
Wealth quintile						
Lowest	65.1	5.3	1,726	54.6	90.0	91
Second	71.9	5.2	1,660	71.4	94.2	86
Middle	74.9	6.9	1,733	70.0	94.6	120
Fourth	84.2	16.7	2,269	71.7	90.6	379
Highest	89.7	22.4	2,567	62.0	88.7	575
Total 15-49	78.7	12.6	9,955	65.8	90.3	1,250

Notes: Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

Source: Zimbabwe National Statistics Agency and ICF International. 2016. Zimbabwe Demographic and Health Survey. 2015: Key Indicators. Rockville, Maryland, USA: Zimbabwe National Statistics Agency (ZIMSTAT) and ICF International. Available from: <http://www.dhsprogram.com/what-we-do/survey/survey-display-475.cfm>. Accessed April 2016.

b. Medical records to evaluate cervical cancer screening

Medical records are usually more readily available than population-level data for cervical cancer screening, and good quality medical records can provide key information on cervical cancer screening efforts at the health-facility level.

Electronic medical records from the United Bulawayo Hospital in Zimbabwe from 2010 -2012 were analyzed to examine the implementation of cervical cancer screening and patient outcomes at the hospital.

Cervical cancer screening: Safety, acceptability, and feasibility of a single-visit approach in Bulawayo, Zimbabwe

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Background: Cervical cancer is the commonest cancer amongst African women, and yet preventative services are often inadequate.

Aim: The purpose of the study was to assess the safety, acceptability and feasibility of visual inspection with acetic acid and cervicography (VIAC) followed by cryotherapy or a loop electrical excision procedure (LEEP) at a single visit for prevention of cancer of the cervix.

Setting: The United Bulawayo Hospital, Zimbabwe.

Methods: The study was descriptive, using retrospective data extracted from electronic medical records of women attending the VIAC clinic. Over 24 months 4641 women visited the clinic and were screened for cervical cancer using VIAC. Cryotherapy or LEEP was offered immediately to those that screened positive. Treated women were followed up at three months and one year.

Results: The rate of positive results on VIAC testing was 10.8%. Of those who were eligible, 17.0% received immediate cryotherapy, 44.1% received immediate LEEP, 1.9% delayed treatment, and 37.0% were referred to a gynaecologist. No major complications were recorded after cryotherapy or LEEP. Amongst those treated 99.5% expressed satisfaction with their experience. Only 3.2% of those treated at the clinic had a positive result on VIAC one year later. The service was shown to be feasible to sustain over time with the necessary consumables. There were no service-related treatment postponements and the clinic staff and facility were able to meet the demand for the service.

Conclusion: A single-visit approach using VIAC, followed by cryotherapy or LEEP, proved to be safe, acceptable and feasible in an urban African setting in Bulawayo, Zimbabwe. Outcomes a year later suggested that treatment had been effective.

Source: Fallala MS, Mash R. Cervical cancer screening: Safety, acceptability, and feasibility of a single-visit approach in Bulawayo, Zimbabwe. *Afr J Prim Health Care Fam Med.* 2015 May 5;7(1). doi: 10.4102/phcfm.v7i1.742. Creative Commons Attribution 4.0 International (CC BY 4.0) license.

4. What are the differences in the kind of information that can be obtained from a population-based survey like DHS versus electronic health records at the United Bulawayo Hospital?

TABLE 1: Programmatic factors and cervical cancer risk factors in relation to VIAC positive results (N = 501).

Variable	Frequency	Percentage
Marital status		
Single	69	13.8
Married	315	62.9
Widowed	89	17.8
Divorced	28	5.6
Previous Pap smear done		
Yes	87	17.4
No	414	82.6
HIV Status		
Positive	263	52.5
Negative	188	37.5
Unknown	50	10.0
Initial complaints		
Vaginal bleeding	47	9.4
Vaginal discharge	41	8.2
Lower abdominal pain (LAP)	107	21.4
LAP and lower back pain	52	10.4
LAP and watery discharge	1	0.2
Lower back pain	6	1.2
Heavy menstruation	1	0.2
Post-coital bleeding	1	0.2
Watery vaginal discharge	6	1.2
LAP and vaginal bleeding	3	0.6
Dyspareunia	1	0.2
Use of contraceptives		
Condoms	87	17.4
Oral contraceptives	102	20.4
Levonorgestrel implant	27	5.4
Tubal ligation	10	2.0
Depot progesterone injection	44	8.8
Intra-uterine contraceptive device	15	3.0

LAP, Lower abdominal pain.

Source: Fallala MS, Mash R. Cervical cancer screening: Safety, acceptability, and feasibility of a single-visit approach in Bulawayo, Zimbabwe. *Afr J Prim Health Care Fam Med.* 2015 May 5;7(1). doi: 10.4102/phcfm.v7i1.742. Creative Commons Attribution 4.0 International (CC BY 4.0) license.

5. What does the information on participant risk factors above tell us about the participant's risk of cervical cancer?

TABLE 2: Selected clinical and programmatic outcomes.

Variable	N	%
Screening (N = 4641)		
VIA test positive	501	10.8
Satisfied with their decision to be tested	4641	100.0
Cryotherapy (N = 85)		
Accepted immediate offer of cryotherapy	84	98.8
Total cryotherapy performed amongst those eligible	84	98.8
Treatments postponed due to staff- or facility-related issues	0	0.0
Delayed treatment due to patient	1	1.9
Clinic visit for perceived problem	0	0.0
Major complications (bleeding, shock, hospitalisation)	0	0.0
Satisfied with their decision to be treated	84	97.7
Complied with post-cryotherapy instructions	82	97.7
Attended follow-up after one year	85	100.0
Tested positive at one year	1	1.2
LEEP (N = 221)		
Accepted immediate offer of LEEP	221	100.0
Total LEEP performed amongst those eligible	221	100.0
Treatments postponed due to staff- or facility-related issues	0	0.0
Delayed treatment due to patient	0	0.0
Clinic visit for perceived problem	0	0.0
Major complications (bleeding, shock, hospitalisation)	1	0.5
Satisfied with their decision to be treated	218	98.6
Complied with post-LEEP instructions	218	98.6
Attended follow-up after one year	213	96.4
Tested positive at one year	7/213	3.2

VIA, visual inspection with acetic acid and cervicograph; LEEP, loop electrical excision procedure.

Source: Fallala MS, Mash R. Cervical cancer screening: Safety, acceptability, and feasibility of a single-visit approach in Bulawayo, Zimbabwe. *Afr J Prim Health Care Fam Med.* 2015 May 5;7(1). doi: 10.4102/phcfm.v7i1.742. Creative Commons Attribution 4.0 International (CC BY 4.0) license.

6. What challenges would you anticipate in expansion of this cervical cancer screening strategy to include other clinics or areas in Zimbabwe?

7. Do you have any additional applied research questions regarding this cervical cancer screening program that may be answered using hospital records?

Part II: Making the Case

Your third and final step is to present your case to the medical foundation. You need to convince them of the need for your program and how funds will be allocated.

Learning points:

- *Understanding and interpreting recommendations around cervical cancer prevention*
 - *Able to draw conclusions and generalizations from available data*
8. Use the background information provided, including Annex 2 and Annex 3, to support your argument. The argument must include a description of the current situation, including (a) burden of disease, (b) strategies for primary prevention, (c) country capacity to treat women diagnosed with cervical cancer, and (d) bias/issues with screening - as identified in questions 1-3.
- a. *Cervical cancer is a leading cause of cancer incidence and mortality among women in Zimbabwe, probably due to the high prevalence of high-risk human papillomavirus (HPV) types in the population. The burden of cervical cancer is expected to increase by more than 65% by the year 2030 due to demographic changes. Mortality rates from cervical cancer are nearly as high as incidence, suggesting low survival which may be a consequence of limited access to early detection and treatment. No primary prevention strategies for cervical cancer have currently been implemented in the country. Moreover, there is a limited capacity to treat newly diagnosed cancer patients in Zimbabwe as new patients need pathology, surgery, chemotherapy and/or radiation therapy services. Given the current situation of cervical cancer in Zimbabwe, the implementation of early detection strategies for cervical cancer remain a priority to potentially reduce the burden of this disease in the country in the country.*
 - b. *Current data indicates that only 13% of the women in Zimbabwe reported ever being screened for cervical cancer, suggesting poor knowledge of the disease. Such low percentage of screening uptake even cuts across different literacy levels and socioeconomic levels. This figure suggests that knowledge of cervical cancer and cervical cancer screening may derive indirectly from living in an urban setting, having social support (married), and having greater educational attainment and greater accumulation of wealth. Women with such characteristics may have greater awareness of and obtain greater benefits from preventive medicine, and may face lower fewer barriers to preventive services.*
 - c. *A relatively high percentage of women who were screened for cervical cancer were in childbearing ages (i.e. 25-29 years, 30-34 years). This result suggest that screening for cervical cancer may be limited to younger women seeking antenatal care and/or family planning clinics while screening services may be limited to older women (i.e. 45-49 years, 11% were screened) who may be at a higher risk of cervical cancer.*
 - d. *Screening uptake in Zimbabwe may be hampered by women's lack of awareness or knowledge about cervical cancer or acceptability about the disease or cervical cancer screening. Socioeconomic factors (wealth, education) may also play a role in seeking care which could result in restricted therapeutic options and lead to poor health outcomes.*

9. Justify the screening strategy and factors to consider in expanding the cervical cancer screening program in Zimbabwe, including (e) screening strategy, (f) resource allocation.

e. *Visual inspection with acetic acid and cervicography (VIAC) followed by treatment with either cryotherapy or LEEP is potentially a feasible and effective strategy for cervical cancer screening in Zimbabwe.*

f. *Resource allocation to increase participation in screening services should focus on (a) raising women's awareness about cervical cancer and cervical cancer screening within the community, particularly in rural areas, taking into account sociocultural differences; (b) the target population for screening should be older women at a higher risk of cervical cancer; (c) encouraging healthcare providers to advocate more efficiently about cervical cancer screening within patient's visits (i.e. prenatal care); (d) educate young women (15-19 years) about cervical cancer prevention and HPV vaccination; (e) training of primary care workers on cancer prevention, early diagnosis, early recognition of signs and symptoms of cervical cancer, and referral for further evaluation.*

Future research and potential investments may be focused on (a) increasing country's capacity to healthcare access by increasing the number of trained personnel, facilities, equipment; (b) cancer surveillance to monitor cancer patterns; and (c) primary prevention strategies for cervical cancer. HPV vaccines should target the most common genotypes (16/18) as well as the genotypes specific for the population (i.e. HPV 58).

10. Based on what you learned in Module 4, explain how would you evaluate the cervical cancer screening program in Zimbabwe after implementation of your recommendations

a. *Evaluate health care professionals' knowledge about cervical cancer and about the purpose and benefits of cervical cancer screening. Inquire from health care professionals' strategies that could work well to invite women to go for screening, identify what could make the test easier for women, understand why women are reluctant to undergo screening, what are the perceptions of their patients with regards cervical cancer and cervical cancer screening.*

b. *Evaluate women's knowledge about cervical cancer and about the purpose and benefits of cervical cancer screening before and after awareness campaign to identify gaps in the awareness program.*

c. *Evaluate barriers among eligible women's attendance to screening for cervical cancer to inform the community and to inform healthcare professionals. This is to improve the mutual understanding of the disease and cervical cancer screening which may help improving screening uptake. Factors that can be evaluated include: sociodemographic factors, embarrassment about the test, worry about the test may be painful, scared about the results, previous bad experience, difficulty arranging the time to go for a screening visit (childcare, household responsibilities, work flexibility, etc.), refusal of husbands or other relatives to grant permission, do not feel at risk of cervical cancer (i.e. no family history of cancer, one sexual partner in a lifetime, etc.), not sexually active hence does not feel the need to go for a screening test, frequency of condom use, does not trust the test, does not have any symptoms, frequency of doctor visits, knowledge of the recommended screening interval, accessibility (transportation mode, travel type), accommodation (provider skills, adequate equipment).*

c. *Evaluate motivators for screening for cervical cancer participation to inform the community and to inform healthcare professionals. This is to improve communications and knowledge exchange between healthcare professionals and clients about the disease and cervical cancer screening which may help improving screening services. Factors that may be evaluated include: (a) women's personal reasons/benefits such as importance of screening to prevent cancer,*

discomfort and/or concerns about the test; and (b) practical issues/convenience such as physical location where the test can be taken (i.e. referral hospital, healthcare center, etc.), freedom to select with whom to take the test (i.e. gynecologist, general physician, preference for the sex of the health professionals involved, etc.), attitude of the physician, prompted to take the test by physician, trust in physician.

- d. Evaluate women's perceptions of the screening test before and after the screening test is conducted to use the results to educate women based on peer's experiences.*
- e. Conduct a survey of the target population to evaluate current screening services utilization. This will help to compare changes in screening uptake as compare to baseline data (i.e. comparing current % of women screened vs. results presented in table 1).*
- f. Evaluation of intermediate outcomes for screening services performance: sociodemographic factors, including age (outside the target age 35-50 years, a reasonable target group for a new program with limited resources, implies increase costs), % women attending, % women with abnormal (precancerous or cancerous lesion) results who underwent for diagnostic test, % women with abnormal results who were followed-up, % of women with abnormal results who needed treatment, % of women treated, time from screening to results delivery and follow-up.*

Evaluation of reasons for follow-up failures in the system to implement strategies to increase attendance. For example: (a) evaluation of the reasons that impede women to go back for follow-up visits such as issues in the mailing process (inaccurate address or mail delivery issues), delays sending invitations, women not recognizing or remembering the invitation letter to attend screening, transportation issues, fear of results, social support, costs of test and/or treatments; (b) gaps in the follow-up system such as invitation letters, written reminders, phone reminders.