GYNECOLOGIC CANCER

Underreported Breast and Cervical Cancer Deaths Among Brought-In-Dead Cases in Zambia

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Introduction

Globally, breast and cervical cancers are the two most common causes of cancer deaths in women age 15-65 years. Of the estimated 592,000 premature deaths from the two cancers in 2020, nearly 90% occurred in low- and middle-income countries.[1] The recently launched WHO Global Strategy to Accelerate the Elimination of Cervical Cancer and Global Breast Cancer Initiative both promote the strengthening of comprehensive cancer control with improved access to effective interventions.[2,3] Although countries expand access, it is critical that they are able to measure the impact of scale-up over time. At the population level, cancer-specific incidence, survival, and mortality are the core indicators for assessing cancer burden trends.[4] Ideally, incidence and survival are provided through a population-based cancer registry and mortality through vital statistics of each country. However, these health information systems are underdeveloped in many resource-constrained countries with high cancer burden. With regard to vital statistics, the WHO shows that only 25% of countries have high-quality cause-of-death (CoD) data.[5]

Zambia is one of the countries facing challenges in collecting accurate CoD data. Through investigations, we noted that a substantial number of deaths occurred before their arrival at the facilities, and their CoD was not fully recorded, including those of breast and cervical cancers.

In this study, taking a case in Zambia as an example, we aimed to describe the actual challenges in counting cancer deaths that occur in communities and explore the utilization of automated verbal autopsy to improve the quality of cancer CoD data.

Challenges in Ascertaining CoD of Cases that Occurred in Communities in Zambia

In Zambia, the vital statistics system has greatly improved over the past several years; however, only one fifth of the estimated 206,224 deaths in the country were registered and certified in 2017.[6] Among the certified cases, 36% of deaths were recorded with ill-defined and unknown CoD. One of the reasons is that a large proportion (approximately 55%) of deaths occur in the community.[7] In a growing number of cases, when a death occurs, the deceased is taken to a health facility by the relatives to obtain a death notification form required for death registration and burial permission from the civil registration office.[8] Investigations revealed that more than one third of deaths recorded at health facilities were those that occurred before their arrival (ie, brought-in-dead cases). Facility health information officers reported that the CoD of brought-in-dead cases was difficult to ascertain because of little medical information available regarding what led to death.

To examine the CoD of brought-in-dead cases, we conducted a study at the University Teaching Hospital, the largest public tertiary hospital in Zambia, between May and August, 2017. The details of this study have been described elsewhere.[8] In brief, for 1,571 brought-in-dead cases more than 1 month old, trained staff interviewed the deceased's relatives and CoD was derived using SmartVA, an automated verbal autopsy computer program validated in previous studies and recommended by the WHO.[9-11] The CoD written in the officially issued death notification form was also retrieved for each case. Through this study, we found erroneous descriptions (eg, recording of symptoms) and potential misclassification in nearly half of the death notification forms. Using SmartVA, the CoD of more brought-in-dead cases was determined, and the distribution of the top 10 causes of death substantially changed.

Comparison of Breast and Cervical Cancer Deaths Derived from SmartVA and Death Notification Forms

In the current study, we compared cancer deaths derived from SmartVA and death notification forms. The sensitivity of verbal autopsy for cancer diagnosis is reported to be relatively high among major disease categories.[12-14]

Of the 512 adult female brought-in-dead cases, 34 (6.6%) were diagnosed with cancer as CoD by SmartVA. Their mean age at death was 52.7 ± 16.3 years. Table 1 shows the cancer cases derived from SmartVA and the matched descriptions in the death notification forms. Although 14 cases were diagnosed with breast cancer by SmartVA, only two cases were in the death notification forms. Similarly, 13 cases were diagnosed with cervical cancer using SmartVA, but only three cases were in the death notification forms.

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TABLE 1. Cancer Deaths Derived From SmartVA and Matched Descriptions in Death Notification Forms

SmartVA Diagnosis (No.)	As Written in Death Notification Form (No.)
Breast cancer (14)	Breast cancer (2)
	Cancer (7)
	Malaria (1)
	Stomach pains (1)
	Natural death (1)
	Tuberculosis (1)
	Asthma (1)
Cervical cancer (13)	Cervical cancer (3)
	Breast cancer (1)
	Cancer (5)
	Urinary obstruction (2)
	Natural death (1)
	Undetermined (1)
Leukemia or lymphoma (2)	Cancer (1)
	Gases (1)
Prostate cancer (1)	Natural cause (1)
Esophageal cancer (1)	Cancer (1)
Lung cancer (1)	Ulcers (1)
Stomach cancer (1)	Sores on throat (1)
Colorectal cancer (1)	Abnormal disease (1)

This suggests that there may be about five times as many breast and cervical cancer deaths among brought-in-dead cases, as reported in death certificates and reflected in the vital statistics system. A large number of cases were recorded as cancer in the death notification forms, which should have been properly assigned to a specific cancer type to be certified as such.

Ethical approval was obtained from the University of Zambia's Biomedical Research Ethics Committee (018-12–16) and the Ethics Committee of the National Center for Global Health and Medicine in Japan (NCGM-G-002167-00). Written informed consent was obtained from the closest relatives of the deceased.

Need for Accurate Cancer Death Data and Utilization of Automated Verbal Autopsy

GLOBOCAN 2020 shows that breast and cervical cancers are the leading causes of cancer deaths in Zambia, with an estimated 400 and 1,900 deaths, respectively.[1] In countries without a complete vital statistics system, these mortality estimates provide valuable information to understand the disease burden and set priorities at the national level. Indeed, Zambia is a leader among countries in strengthening cancer control under the National Cancer Control Strategic Plan 2016-2021, which prioritizes breast and cervical cancers, along with prostate and retinoblastoma.[15] Through expanded access to awareness, prevention, early detection, treatment, and care, the plan aims to reduce mortality of each cancer type by 25% by 2025. For monitoring progress, however, it is essential that the number of cancer deaths be correctly counted and recorded.

To improve CoD data, there is a need to systematically certify the deaths that occur in the community in a better way. The application of physician-certified verbal autopsy, in which trained physicians identify CoD using interview data, is an option. However, this requires significant human and financial resources for training and implementation, and its nationwide expansion may be difficult in resource-constrained settings. The utilization of automated verbal autopsy, which allows operation by nonmedical staff, may be a more practical approach for routine implementation.[16] Since a growing number of death cases are carried to health facilities, recording better CoD for brought-in-dead cases can be an entry point for improvement, and the health sector can play a key role.[17]

In conclusion, our analysis suggests that breast and cervical cancer deaths occurring in the community may be substantially underreported in Zambia. Although many resource-limited countries are trying hard to expand access to cancer interventions, collecting accurate CoD data remains a major challenge. Utilization of automated verbal autopsies could help capture more accurate CoD data. No women should die from breast and cervical cancer without being counted.

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DATA SHARING STATEMENT

The data sets generated and/or analyzed during the study are not publicly available due to ethical restriction (patient confidentiality) but are available from the corresponding author on reasonable request.

AUTHOR CONTRIBUTIONS

Conception and design: Rei Haruyama, Yuta Yokobori
Provision of study materials or patients: Yuta Yokobori
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Data analysis and interpretation: All authors
Manuscript writing: All authors
Final approval of manuscript: All authors
Accountable for all aspects of the work: All authors

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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Open Payments is a public database containing information reported by companies about payments made to US-licensed physicians (Open Payments).

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