

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	The Burden of Cancer in the General Surgical Population in the Eastern Region of Ghana
AUTHORS	Olecki, Elizabeth; Ssentongo, Paddy; Dao, Joseph; Wong, William; Stahl, Kelly; Ofosu-Akromah, Richard; Amponsah-Manu, Foster; Pameijer, Colette

VERSION 1 – REVIEW

REVIEWER	Theresa Gillespie Emory University, Department of Surgery
REVIEW RETURNED	26-May-2021

GENERAL COMMENTS	<p>The importance of cancer registries, particularly population-based cancer registries (PBCR), cannot be over-stated and this is especially true in low-and-middle-income countries (LMIC). The lack of such PBCR throughout much of the world is a consistent barrier to setting priorities and allocating funding by LMIC's ministries of health and other agencies. The authors are to be congratulated on exploring methods to estimate the cancer burden in one region of Africa, and describing the surgical oncologic needs in that area. The limitations of their approach, which are considerable in terms of cancer epidemiology, are clearly described, and the findings are primarily descriptive. However, in view of the resources available for PBCR, or lack thereof, in Ghana and other countries in sub-Saharan Africa, the efforts from this paper are valuable and contribute important new information to our understanding of the burden of cancer in this global setting. The methodology could readily be replicated by other LMIC, which would then contribute further to the picture of the burden of cancer and the considerable needs for surgery in neighboring countries lacking PBCR. It has been widely documented that the need for surgery in LMIC is significant, often overwhelming, while the capacity to meet these needs is far too small. This study describes the specific cancer surgery needs in greater detail, thus allowing better planning for capacity building. The overall findings are important to the literature related to cancer burden and treatment modalities in LMIC.</p>
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REVIEWER	David Watters Deakin University, Surgery
REVIEW RETURNED	27-May-2021

GENERAL COMMENTS	<p>This paper is essentially an audit of cancer cases from a region of Ghana which has not previously published on this topic. The findings only allow descriptive statistics listing numbers of different cancers with the denominators being no of surgical procedures. There are no population denominators on numbers of</p>
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	<p>admissions/operations/malignancies. Its relevance is for local readership. The papers is similar to many LMIC papers published over the past 50 years about the contribution of cancer to surgical workload. There is nothing surprising for those with experience of the presentation or stage of cancer in sub-Saharan Africa, or other LMICs with access to surgery issues. There are two Ghanaian authors with 6 listing their institution as Penn State College of Medicine. There does not seem to be quite enough Ghanaian ownership/input, given this is about Eastern Ghana malignancy requiring surgical procedures, or if there is more, this is not stated. I don't think there are ethical issues with the de-identified data, only that generally we like to ensure there is significant local input to papers from LMICs. I believe this paper belongs in a local journal. It is well written and does not claim to be more than it is. The abstract is reflective of the whole paper.</p>
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REVIEWER	Massimo Di Maio Università degli Studi di Torino, Dipartimento di Oncologia, AO Ordine Mauriziano
REVIEW RETURNED	04-Oct-2021

GENERAL COMMENTS	<p>I read with interest the manuscript by Olecki and colleagues, describing the burden of surgical activity, with a specific focus on cancer surgery, in the Eastern Region of Ghana. The epidemiological description of incidence, prevalence and mortality for cancer in that region is severely limited by the absence of comprehensive tumor registries, as clearly discussed by the authors. Their data try to give an estimation of the amount of the disease by counting the number of surgical procedures. The effort should be appreciated, although there are many important limitations (most of them have been explicated and discussed by the authors).</p> <p>My major comments:</p> <ol style="list-style-type: none"> 1. My impression is that by describing the number of pathological diagnoses among patients undergoing surgery, the authors are trying to describe the burden of tumors by looking through the door lock. I suppose that many patients have difficult access to the hospital. Is it possible to estimate (at least by proportioning the number of inhabitants of the region considered with the number of inhabitants of the entire nation) the number of diagnoses expected in the period of time considered? I understand that this estimation is difficult, but reading at the paper I am not able to estimate if the number of subjects who received a cancer diagnosis in the interval considered is grossly underestimated, or it is a good approximation of the "cancer burden" in that region. 2. About 3 patients out of 4 had a insurance. What is the proportion of insurance-covered patients in the nation? I suppose this can impact the chance of undergoing surgery and, again, this could lead to an important underestimation of cancer cases. 3. Median age, for all types of tumors, is clearly lower than what is observed in Europe or North America. This is obviously related to the different life expectancy and epidemiology in Ghana. My question is: elderly patients have the same chance of undergoing surgery compared to younger patients (for clinical / economical / logistical reasons)? This could represent another reason of
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	<p>underestimation of the number of cases.</p> <p>4. I suppose that, before the admission, patients are visited to confirm suspect and check eligibility for the admission? Is it not possible to check the registries of these visits? This could help to obtain a more sensible estimation of patients who, even with a suspect of cancer, are judged not eligible for surgery due to comorbidities, age or to the stage of disease...</p> <p>Minor comments: Table 1: please check the age range (0 - 140)??</p> <p>Figure 1. It could be useful to add in the figure, for each type of organ, the number of surgical procedures without pathology details, and the number (and proportion) of cases with diagnosis of cancer.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
 Prof. Theresa Gillespie, Emory University
 Comments to the Author:

The importance of cancer registries, particularly population-based cancer registries (PBCR), cannot be over-stated and this is especially true in low-and-middle-income countries (LMIC). The lack of such PBCR throughout much of the world is a consistent barrier to setting priorities and allocating funding by LMIC's ministries of health and other agencies. The authors are to be congratulated on exploring methods to estimate the cancer burden in one region of Africa, and describing the surgical oncologic needs in that area. The limitations of their approach, which are considerable in terms of cancer epidemiology, are clearly described, and the findings are primarily descriptive. However, in view of the resources available for PBCR, or lack thereof, in Ghana and other countries in sub-Saharan Africa, the efforts from this paper are valuable and contribute important new information to our understanding of the burden of cancer in this global setting. The methodology could readily be replicated by other LMIC, which would then contribute further to the picture of the burden of cancer and the considerable needs for surgery in neighboring countries lacking PBCR. It has been widely documented that the need for surgery in LMIC is significant, often overwhelming, while the capacity to meet these needs is far too small. This study describes the specific cancer surgery needs in greater detail, thus allowing better planning for capacity building. The overall findings are important to the literature related to cancer burden and treatment modalities in LMIC.

Thank you for your kind review and comments of our manuscript. We agree that our findings and methodology will be an important contribution to existing literature regarding the existing cancer burden and resource allocation in LMIC and specifically in the Eastern Region of Ghana.

Reviewer: 2
 Dr. David Watters, Deakin University, Barwon Health
 Comments to the Author:

This paper is essentially an audit of cancer cases from a region of Ghana which has not previously published on this topic. The findings only allow descriptive statistics listing numbers of different cancers with the denominators being no of surgical procedures. There are no population denominators on numbers of admissions/operations/malignancies. Its relevance is for local readership.

The paper is similar to many LMIC papers published over the past 50 years about the contribution of cancer to surgical workload. There is nothing surprising for those with experience of the presentation or stage of cancer in sub-Saharan Africa, or other LMICs with access to surgery issues.

There are two Ghanaian authors with 6 listing their institution as Penn State College of Medicine. There does not seem to be quite enough Ghanaian ownership/input, given this is about Eastern Ghana malignancy requiring surgical procedures, or if there is more, this is not stated. I don't think there are ethical issues with the de-identified data, only that generally we like to ensure there is significant local input to papers from LMICs.

I believe this paper belongs in a local journal.

It is well written and does not claim to be more than it is.

The abstract is reflective of the whole paper.

Thank you for bringing up the significance of authorship contribution. The two authors with Ghanaian affiliation, Ofosu-Akromah and Amponsah-Manu, were the only 2 general surgeons operating at Koforidua Regional Hospital during the study period. Both authors were instrumental in the design, data collection, interpretation of the results, and writing of this manuscript. The clinical question regarding the surgical burden of cancer at Eastern Regional Hospital originated during visit from the principal investigator via Penn State College of Medicine's global health partnership with Eastern Regional Hospital. The results of this study were deemed as a clinically relevant and important question by Dr. Ofosu-Akromah and Dr. Amponsah-Manu who had observed a high prevalence of cancer related disease in their surgical population. This manuscript includes substantial Ghanaian contribution and input and has been presented to hospital leadership to aid in decisions regarding resource allocation. We believe that this manuscript demonstrates the strengths of the partnership between Eastern Regional Hospital and Penn State College of Medicine.

Reviewer: 3

Prof. Massimo Di Maio, Università degli Studi di Torino

Comments to the Author:

I read with interest the manuscript by Olecki and colleagues, describing the burden of surgical activity, with a specific focus on cancer surgery, in the Eastern Region of Ghana.

The epidemiological description of incidence, prevalence and mortality for cancer in that region is severely limited by the absence of comprehensive tumor registries, as clearly discussed by the authors. Their data try to give an estimation of the amount of the disease by counting the number of surgical procedures.

The effort should be appreciated, although there are many important limitations (most of them have been explicated and discussed by the authors).

My major comments:

1. My impression is that by describing the number of pathological diagnoses among patients undergoing surgery, the authors are trying to describe the burden of tumors by looking through the door lock. I suppose that many patients have difficult access to the hospital. Is it possible to estimate (at least by proportioning the number of inhabitants of the region considered with the number of inhabitants of the entire nation) the number of diagnoses expected in the period of time considered? I understand that this estimation is difficult, but reading at the paper I am not able to estimate if the number of subjects who received a cancer diagnosis in the interval considered is grossly underestimated, or it is a good approximation of the "cancer burden" in that region.

Thank you for this thoughtful question. We understand your comment is asking if a standard exists that we can compare our results to in order to determine if our methodology is an appropriate approximation. Unfortunately, a means of which to estimate the expected malignant diagnoses in the

Eastern Region of Ghana and Ghana as a whole does not currently exist in any capacity. While we agree that this study represents a very specific demographic of malignant diagnoses in the region, this is the first study of its kind to document any information regarding malignant disease in this area. We believe that this information is valuable both locally in terms of capacity building and globally in terms of understanding cancer burdens in similar low resource settings as well as presenting a new methodology used in this study. The lack of population based cancer registries and reliable hospital based medical records has made even rudimentary understanding of impact of malignant disease in the Eastern Region of Ghana and other non-urban cities in LMIC essentially nonexistent. We believe that even despite the limitations that we have outlined in our discussion, that this study hold immense value. We believe that this study will serve as the estimate you mention in your question for future studies to use as a comparison. While this study may be looking through the “door lock” as you said, it is currently the only look we have into this relevant question and we believe this study will serve as the foundation and benchmark for future studies to use as a comparison.

2. About 3 patients out of 4 had a insurance. What is the proportion of insurance-covered patients in the nation? I suppose this can impact the chance of undergoing surgery and, again, this could lead to an important underestimation of cancer cases.

In the time period of this study, about 40% of individuals nationwide were documented to have national health insurance scheme (<https://www.statista.com/statistics/1172722/share-of-people-with-active-national-health-insurance-membership-in-ghana/>). We suspect that the high percentage of insured patients in this study is secondary to this study being a hospital based population. We hypothesize that those with health insurance are more likely seek medical care and therefore be more likely to be diagnosed and treated for a malignancy compared to those without insurance. Thank you for making this important observation. This study could certainly be underestimating the incidence of cancer diagnoses in the population given that this study is skewed to include a higher percentage of insured patients than is representative of the population of Ghana. We have added this important limitation to our discussion. Thank you for allowing us to improve the quality of our work.

3. Median age, for all types of tumors, is clearly lower than what is observed in Europe or North America. This is obviously related to the different life expectancy and epidemiology in Ghana. My question is: elderly patients have the same chance of undergoing surgery compared to younger patients (for clinical / economical / logistical reasons)? This could represent another reason of underestimation of the number of cases.

While we do not have data regarding those who did not seek medical care at Eastern Regional Medical Center for their cancer, based upon discussion with local providers, in their experience older patients are less likely than younger patient to seek medical care for all health issues including potential malignancy. Additionally, based up observation, older patients are more likely than younger patients to rely on alternative medicine outside of hospitals and are more likely to refuse to seek formal care. Therefore, as you pointed out, we suspect that this could be somewhat responsible for the young median age observed in this study. We have added this to the limitations. Thank you for allowing us to improve the transparency of our work.

4. I suppose that, before the admission, patients are visited to confirm suspect and check eligibility for the admission? Is it not possible to check the registries of these visits? This could help to obtain a more sensible estimation of patients who, even with a suspect of cancer, are judged not eligible for surgery due to comorbidities, age or to the stage of disease...

We agree that using data from all evaluated individuals would give us a better idea of the true incidence of malignancies in this population. Unfortunately, this detailed level of information of patient

visits and evaluations is not routinely recorded. The medical records at Eastern Regional Hospital, like a majority of hospitals in low-middle income countries, are inconsistent in documentation and do not reliably capture detailed information on a majority of the patients evaluated and their treatment. The surgical department is unique in that they have developed a medical record system that documents all of the admissions and operations performed by the surgical service. This medical record system has been translated into the database used in this study. We do recognize the limitations of the available data being limited to those admitted to the surgical service.

VERSION 2 – REVIEW

REVIEWER	Massimo Di Maio Università degli Studi di Torino, Dipartimento di Oncologia, AO Ordine Mauriziano
REVIEW RETURNED	08-Jan-2022
GENERAL COMMENTS	I have no further comments