

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	How has COVID-19 impacted the civil registration and vital statistics system in Loreto, Perú? Evidence using process mapping and qualitative analysis.
AUTHORS	Silva-Valencia, Javier; Adair, Timothy; Hart, John; Meza, Graciela; Vargas Herrera, Javier

VERSION 1 – REVIEW

REVIEWER	Lima, Everton Universidade Estadual de Campinas, Demography
REVIEW RETURNED	03-Sep-2021

GENERAL COMMENTS	<p>The paper is well written and with a clear structure. Reading it, I learn a lot about the vital statistic registration system of this country.</p> <p>In the introduction and other parts of the paper, the authors claimed that their research was the first that analysis the impact of the COVID-19 crisis on death registration process. Considering only the process of registration, this is true. But I advise the authors to include this reference Sempé et al. (2021). Sempé et al. (2021) Estimation of all-cause excess mortality by age-specific mortality patterns for countries with incomplete vital statistics: a population-based study of the case of Peru during the first wave of the COVID-19 pandemic. The Lancet Regional Health. https://doi.org/10.1016/j.lana.2021.100039.</p> <p>Data section</p> <p>In Line 10. Please, provide the full names before the acronyms, or just remove this part. It was confusing to decipher that. Only at the end of the paper that I figured that the acronyms refer to two authors of the study.</p> <p>In the discussion part, the authors affirm that during the pandemic the SINADEF coverage has increased in comparison with previous years. As consequence of the increasing number of doctors that started to use more the on-line system of death registration. For me, this is an interesting point, giving the fact that many people believe the COVID-19 crisis might be affect negatively the registration systems. I would recommend the authors to elaborate more about this affirmation. Because, if this is true, studies about excess mortality (including the one of Sempé et al. 2021) are overestimating this measure, or part of the excess deaths in 2020 could be explained by this increasing coverage of SINADEF?</p> <p>Additionally, in the discussion many parts repeat things already described in previous moments of the paper, findings etc. Thus, consider remove redundant ideas.</p> <p>I would advice to include more information about how these findings could be extrapolated to the registration process of the whole country and its other regions. I also advise to increase the</p>
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	discussion part and cite possible strengths and limitations that the pandemic brought to the mortality studies in the region and/or country, and which public policies could be implemented to improve more the death registration process in the country. I suggest merging the conclusion and discussion parts.
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REVIEWER	Kelly, Matthew The Australian National University, National Centre for Epidemiology & Population Health
REVIEW RETURNED	15-Sep-2021

GENERAL COMMENTS	<p>This was a clear and detailed account of the impact of the COVID-19 pandemic on Civil Registration and Vital Statistics data collection. This is an important issue in almost all countries globally, and a detailed case study like this gives valuable insights into the challenges faced. I have some comments and questions detailed below that may strengthen the paper.</p> <ol style="list-style-type: none"> 1. The authors state that there have been no studies to date of the impact of COVID-19 on CRVS. This may be a timing issue that meant the authors missed this, but there have been two papers recently published that I am aware of. These papers address the issue globally so they do not detract from the value of this paper, but they could be considered for completeness: <ol style="list-style-type: none"> a. Kelly et al (2021) Lessons Learnt and Pathways forward for National Civil Registration and Vital Statistics Systems after the COVID-19 Pandemic, Journal of Epidemiology and Global Health, 11(3) AND b. AbouZahr et al (2021) The COVID-19 Pandemic: Effects on Civil Registration of Births and Deaths and on Availability and Utility of Vital Events Data, American Journal of Public Health, 111, 1123_1131 2. Although this article gives a high level of detail regarding the death registration process I am still a little unclear regarding the interactions between the health sector recording of deaths and the civil registry. It has been observed in other settings that during the COVID pandemic the health sector has been recording, and reporting deaths to international agencies tracking COVID mortality. In settings where the CRVS system was recording very few deaths pre-pandemic, these countries are now reporting deaths, although not necessarily registering these deaths with the civil registry. Is there some chance that could be the case here as well? 3. In the introduction the authors mention that before the pandemic the CRVS processes were sub-optimal. It would be helpful at this stage to inform the readers briefly in what ways it was sub-optimal. I know you come to this in the Discussion, but talking about it in the Introduction would give us context for what follows, in terms of disruptions caused by the pandemic. The Discussion could consider how the existing problems were exacerbated by COVID pandemic. 4. It would be interesting to know a little more about the stakeholders interviewed. The institutions were described but not the interviewees' positions within the institutions. The main reason I mention this is that it would be interesting to know for example how senior the stakeholders were in their institutions. 5. Page 11, line 35 the authors say: "During the week of May 3 to 9, Loreto reported more than seven times the weekly historical number of deaths,..." Does this mean the civil registry recorded 7 times the historical number? Or the health sector recorded 7 times the historic average?
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	<p>6. You mention in the death registration process that families get the medical certificate and then choose whether to then go and register with the civil registry. Is there actually a legal requirement for them to register the death, but it is not enforced? OR is it actually just up to the family's choice?</p> <p>7. I understand that the main message of your article is that overall death registration services were disrupted by the pandemic. It would be interesting to know whether the disruptions affected COVID-19 related deaths, equally with deaths from other causes. That is, was the impression of your informants that COVID-19 deaths would be under reported to an equal extent to non-COVID related deaths?</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Everton Lima, Universidade Estadual de Campinas

Comments to the Author:

The paper is well written and with a clear structure. Reading it, I learn a lot about the vital statistic registration system of this country.

We thank the reviewer for their valuable comments.

In the introduction and other parts of the paper, the authors claimed that their research was the first that analysis the impact of the COVID-19 crisis on death registration process. Considering only the process of registration, this is true. But I advise the authors to include this reference Sempé et al. (2021).

Sempé et al. (2021) Estimation of all-cause excess mortality by age-specific mortality patterns for countries with incomplete vital statistics: a population-based study of the case of Peru during the first wave of the COVID-19 pandemic. *The Lancet Regional Health*. <https://doi.org/10.1016/j.lana.2021.100039>.

We have now included this reference to the Sempé article in the 5th paragraph of the Introduction (ref. 23) with respect to the challenges of assuming whether completeness has changed during the pandemic when estimating excess mortality in a setting with incomplete registration data.

We have also added in citations to 2 other papers in the 2nd paragraph of the Introduction about disruptions to registration processes caused by COVID-19 (refs. 11-12).

Data section

In Line 10. Please, provide the full names before the acronyms, or just remove this part. It was confusing to decipher that. Only at the end of the paper that I figured that the acronyms refer to two authors of the study.

We have now removed these acronyms.

In the discussion part, the authors affirm that during the pandemic the SINADEF coverage has increased in comparison with previous years. As consequence of the increasing number of doctors that started to use more the on-line system of death registration. For me, this is an interesting point, giving the fact that many people believe the COVID-19 crisis might be affect negatively the registration systems. I would recommend the authors to elaborate more about this affirmation. Because, if this is true, studies about excess mortality (including the one of Sempé et al. 2021) are overestimating this measure, or part of the excess deaths in 2020 could be explained by this increasing coverage of SINADEF?

The reviewer makes a good point about the pandemic and completeness of the registration system. We have now clarified this in the 5th paragraph of the Discussion. The closure of civil registry offices and increased use of the online system (we now add reference 35 to support this) may have had a positive impact on death registration. While there were negative impacts on completeness due to other factors disruption the system, it is possible that completeness may have improved during the pandemic. However, we clarify that some of the increase in registered deaths (rather than completeness) could be due to continued impacts of the pandemic on actual mortality, as well as improved timeliness of registration because of the efficiency of the online system. Further research is required to assess whether, and to what extent, completeness in all regions of Peru changed during the pandemic. We also now state that any increase in completeness of SINADEF during the pandemic would have implications for the measurement of excess mortality. We also state in the Abstract that there was increased use of the online system during the pandemic.

Additionally, in the discussion many parts repeat things already described in previous moments of the paper, findings etc. Thus, consider remove redundant ideas.

We have now reduced the length of the 2nd and 3rd paragraphs of the Discussion to remove information and findings mentioned earlier.

I would advice to include more information about how these findings could be extrapolated to the registration process of the whole country and its other regions. I also advise to increase the discussion part and cite possible strengths and limitations that the pandemic brought to the mortality studies in the region and/or country, and which public policies could be implemented to improve more the death registration process in the country.

It is possible that the findings from this study are similar to what happened with other countries that share a similar CRVS system (on paper and online), and that they may have had the same problems due to the burden of the increase in deaths, shortage of paper forms, implementation of the protocol of less physical contact and existence of areas with limited access to the Internet. There are reports from other countries that show that during the pandemic its CRVS system was also disturbed in a similar way to what was found in this study, such as the suspension of the registration of some vital events in Argentina and the closure / reduction of hours of operation of the civil registry offices in Uganda and Samoa. (1) Likewise, in Ghana a decrease in reports of deaths due to fear and panic of COVID-19 was found (1). All this could have caused a flow of processes similar to those reported in this study where the burden on the family increased and leading to a greater participation of unregulated organizations.

The pandemic brought with it several limitations in the CRVS system worldwide, mainly due to legal and operational restrictions that were difficult to adapt to the context (2). However, it was also the best time to increase adoption of online records. In Peru, the existence of SINADEF online supported the continuity of the CRVS data record.

In the last paragraph of the Discussion, we now state that “The findings can serve to prepare for future outbreaks or pandemics, not only in Peru but in other countries with similar CRVS system characteristics. For example, deficiencies in the CRVS system are likely to be exacerbated during the pandemic, as shown with the problems in Peru caused by lack of supervision of death certificate data collection. Hence, countries should endeavor to conduct in-depth assessments of their system and seek to rectify such issues, which will help the system be produce better quality data at all times and

not just in a pandemic. Additionally, countries should seek to digitize their system which this study showed to be more resilient during a pandemic than paper-based systems.”

- (1) UNLIA survey: Impact of the COVID-19 pandemic on Civil registration and vital statistics. Global CRVS Group. Available from: <https://unstats.un.org/legal-identity-agenda/COVID-19/>
- (2) AbouZahr, Carla et al. “The COVID-19 Pandemic: Effects on Civil Registration of Births and Deaths and on Availability and Utility of Vital Events Data.” American journal of public health vol. 111,6 (2021): 1123-1131. doi:10.2105/AJPH.2021.306203

I suggest merging the conclusion and discussion parts.
Many previous articles published by this journal have a Conclusion, so we have decided to retain the Conclusion and Discussion as separate.

Reviewer: 2
Mr. Matthew Kelly, The Australian National University

Comments to the Author:
This was a clear and detailed account of the impact of the COVID-19 pandemic on Civil Registration and Vital Statistics data collection. This is an important issue in almost all countries globally, and a detailed case study like this gives valuable insights into the challenges faced. I have some comments and questions detailed below that may strengthen the paper.

We thank the reviewer for their valuable comments.

1. The authors state that there have been no studies to date of the impact of COVID-19 on CRVS. This may be a timing issue that meant the authors missed this, but there have been two papers recently published that I am aware of. These papers address the issue globally so they do not detract from the value of this paper, but they could be considered for completeness:
a. Kelly et al (2021) Lessons Learnt and Pathways forward for National Civil Registration and Vital Statistics Systems after the COVID-19 Pandemic, Journal of Epidemiology and Global Health, 11(3) AND

b. AbouZahr et al (2021) The COVID-19 Pandemic: Effects on Civil Registration of Births and Deaths and on Availability and Utility of Vital Events Data, American Journal of Public Health, 111, 1123_1131

We thank the reviewer for suggesting these papers, we have now added them as references in the 2nd paragraph of the Introduction (refs 11-12). We now state that our study is one of the first studies investigating the impact of the pandemic on death registration processes, and the first we are aware of that has conducted in-depth interviews with key informants within the system (6th paragraph of the Discussion and also in the Strengths and Limitations).

2. Although this article gives a high level of detail regarding the death registration process I am still a little unclear regarding the interactions between the health sector recording of deaths and the civil registry. It has been observed in other settings that during the COVID pandemic the health sector has been recording and reporting deaths to international agencies tracking COVID mortality. In settings where the CRVS system was recording very few deaths pre-pandemic, these countries are now reporting deaths, although not necessarily registering these deaths with the civil registry. Is there some chance that could be the case here as well?

Thanks for the comment. Yes, that happened in Peru. During the pandemic, especially in the first wave, the physical civil registry offices were closed. At that time, the civil registry only registered deaths in the SINADEF online system, (the death information system of the health sector) because it was there that the identity of the deceased could be verified with fewer errors. In Peru, the information sent to international organizations belongs to the death reporting process in the health sector.

3. In the introduction the authors mention that before the pandemic the CRVS processes were sub-optimal. It would be helpful at this stage to inform the readers briefly in what ways it was sub-optimal. I know you come to this in the Discussion, but talking about it in the Introduction would give us context for what follows, in terms of disruptions caused by the pandemic. The Discussion could consider how the existing problems were exacerbated by COVID pandemic.

We have now moved a reason for the low completeness of registration from the Discussion to the 3rd paragraph of the Introduction (as identified by a previous study – reference 15).

4. It would be interesting to know a little more about the stakeholders interviewed. The institutions were described but not the interviewees' positions within the institutions. The main reason I mention this is that it would be interesting to know for example how senior the stakeholders were in their institutions.

The stakeholders interviewed included very senior staff such as a Managing Director or Executive Director of the institution, technical staff including from the IT technical team, and physicians. We have added this to the 2nd paragraph of the Sampling and recruitment sub-section of the Methods section.

5. Page 11, line 35 the authors say: "During the week of May 3 to 9, Loreto reported more than seven times the weekly historical number of deaths,..." Does this mean the civil registry recorded 7 times the historical number? Or the health sector recorded 7 times the historic average?

We wanted to say that the health sector reported 7 times the historical average. We have now amended the sentence to say "During the week of May 3 to 9, Loreto's health sector reported more than seven times the weekly historical average number of deaths".

6. You mention in the death registration process that families get the medical certificate and then choose whether to then go and register with the civil registry. Is there actually a legal requirement for them to register the death, but it is not enforced? OR is it actually just up to the family's choice?

Yes, there is a law, but it is not followed. The Organic Law of the National Registry of Identification and Civil Status - Law No. 26497 (1) in Peru mentions that all deaths must be registered in a mandatory manner. However, the farther away they are from cities, the less likely it is for the state to oversee these regulations. Thus, in rural communities there are deaths that are not registered in the civil registry but do have a death certificate. The pandemic also aggravated this condition because the state did not have the capacity to enforce the norm and citizens were unaware of the norm. We now mention in the 2nd paragraph of the Results section that it is mandatory for families to register a death.

(1). Gobierno Peruano. LEY N 26497 Ley Orgánica del Registro Nacional de Identificación y Estado Civil. 1995. Available from: <https://www.reniec.gob.pe/portal/html/rrcc/ley26497.html>

7. I understand that the main message of your article is that overall death registration services were disrupted by the pandemic. It would be interesting to know whether the disruptions affected COVID-19 related deaths, equally with deaths from other causes. That is, was the impression of your informants that COVID-19 deaths would be under reported to an equal extent to non-COVID related deaths? At the beginning of the pandemic, deaths from COVID-19 may have been reported to a lesser extent than non-COVID-related deaths. Interviewees reported that during the first weeks of the pandemic in families there was fear of reporting a death from COVID-19 due to nationally imposed regulations to incinerate all bodies, news of the loss of corpses and not being able to hold a wake to say goodbye to loved ones. It has been reported that in some families more deeply rooted in their customs, they asked the doctor not to indicate that the death was due to COVID-19. We have added a sentence in point 5 of the "impact on death certification" sub-section that loss of corpses may have led to COVID-19 deaths being affected more by registration system disruptions more than for non-COVID deaths.

Some co-authors are currently conducting a study to characterize the non-Covid deaths registered using IRIS to obtain real basic causes. This study may shed more light on the issue that the reviewer is asking about.

VERSION 2 – REVIEW

REVIEWER	Kelly, Matthew The Australian National University, National Centre for Epidemiology & Population Health
REVIEW RETURNED	03-Nov-2021
GENERAL COMMENTS	Thanks to the authors for addressing all of my comments. I am happy to accept this revised version.