PERU'S THIRD WAVE SCENARIOS FOR COVID-19 PANDEMIC: SRH AND MATERNAL HEALTH IMPLICATIONS

1. BACKGROUND:

Peru has been one of the hardest hit countries globally during the first year and a half of current SARS-CoV-2 pandemic. According to official records, the death toll since early March 2020 is about two hundred thousand[1], with other estimates reporting about 30% higher[2]. This represents about 6 per thousand deaths (or 600 per 100.000), among the highest in the world, twofold the second largest[3].

Despite the seriousness of Peru's situation, it has not attracted significant international attention, as have other countries like India or Brazil. India, with a population forty times larger than Peru and a much lower mortality rate (33 per 100.000) has received larger attention[4][5], probably explained by geopolitical factors, including the fact that it is one of major manufacturers of COVID-19 vaccines (AstraZeneca). Brazil, a country with seven times Peru's population has also received more attention, although its death rate is lower than half. Had India the same death rate due to SARS-CoV-2 as Peru, its death toll would be six times higher than current estimates according to the Institute of Health Metrics and Evaluation (IHME) at the University of Washington[6](see Annex).

As of August 2021, Peru has undergone two major waves of the SARS-CoV-2 pandemic. The first during the second and third quarters of 2020, and the second during first and second quarters of 2021. Both waves have had different epidemiological dynamics: the first one moving from North-East to Center-South, with no major virus variants of concern identified; the second one, hitting the country simultaneously, affecting younger cohorts, with new variants of concern. During this time span, important progress has been achieved regarding vaccination of health providers (with Sinopharm), and an accelerated vaccination roll-out has been implemented in diverse areas of the country, with predominance of the Pfizer-BioNTech vaccine. The country secured agreements with various vaccine providers, and thus it is expected that by end 2021 the country will have received shipments of vaccines to protect all its population. In June 2021, pregnant women (28 weeks and more) were prioritized in the vaccination roll-out; vaccinated pregnant women having received at least one dose as of August 2021 amount to about ninety thousand women[7], which is equivalent to less than one fifth of expected annual births.

For the last two decades, Peruvian women in union have had the lowest modern contraceptive prevalence rate (55%) in comparison to neighboring South American countries (above 76%) and the Latin

[1] https://www.datosabiertos.gob.pe/dataset/fallecidos-por-covid-19-ministerio-de-salud-minsa

[2] https://covid19.healthdata.org/peru

[3] https://coronavirus.jhu.edu/data/mortality

[4] Reddy KS. Editorial: Pandemic lessons from India. BMJ 2021; 373: n1196 doi:10.1136/bmj.n1196

[5] The Lancet. Editorial: India's COVID-19 emergency. Lancet. 2021 May 8;397(10286):1683. doi: 10.1016/S0140-6736(21)01052-7. PMID: 33965073; PMCID: PMC8102046.

[6] https://covid19.healthdata.org/india?view=cumulative-deaths&tab=trend

[7] https://www.minsa.gob.pe/reunis/data/vacunas-covid19.asp

American regional average (69%). Territorial, ethnic, social and economic inequalities have deepened sexual and reproductive health disparities exposing Peruvian women to risky and unplanned pregnancies. For instance, only half of Peruvians women 12-24 years of age used a condom in their first sexual intercourse (national 49.6%, 55.2% rural, and 23.8% rural), the use of modern methods among women in union from rural areas (48.7%), Highlands (46.9%), with low education level (36.5%), in the lower income quintile (47.3%), with a native mother tongue (46.3%) are significantly lower than the country average. The case of the departments of Puno (29.6%) and Huancavelica (38%) stands out. The lesser progress in the use of modern methods among female adolescents (51.1%) is noteworthy, as well as the fact that 36% of female adolescents in union do not use any contraceptive method. As such, pregnancy among adolescents in the lowest income quintile is one in four adolescents while in the richest quintile is one in thirty-three[8]. Regrettably, these indicators may be worsening by the economic effects of the pandemic limiting further women's bodily autonomy and the exercise of their sexual and reproductive rights and consequently exposing a given women's profile to higher maternal mortality risks in the context of the pandemic.

2. THIRD WAVE SCENARIOS OF THE CURRENT PANDEMIC

In last few weeks, a raising concern about the feasibility of a third wave has gained attention, by both local specialists and health officials.

In this very short account of available information, released by national specialized institutions, as well as academic institutions, we discuss the implications of trends for UNFPA transformative results, focusing on the implications for maternal mortality.

Sexual, reproductive and maternal health services have been affected since the start of the pandemic. During 2020, the number of recorded maternal deaths was 439, which was 137 higher than the previous year (45% higher)[9], and one out of six maternal deaths was caused by COVID-19. During 2021, two out of five maternal deaths have been caused by COVID-19, while the trending projection is about 546, which may represent 80% higher than the year 2019. What can be foreseen from current projections into the near future?

While there is no certainty that a third wave will hit Peru, it is quite certain that the experiences from other countries, not matter if advancing its vaccine roll-out, force us to prepare for an even worse scenario in coming months. The costs of prioritizing the health services response during the pandemic might be high, but never as high as the costs of not doing so.

Three other certainties are relevant to this point: the limited genomic surveillance of variants of concern[10], the roll-out of vaccination lagging pregnant women behind, and the fact that none of these projections pays specific attention to maternal mortality. Sources reviewed use different methodologies and report different timeframes and for different purposes, as different are their basic assumptions and time-frames as is depicted in next table:

[8] INEI. Encuesta Demográfica y de Salud Familiar (ENDES) 2020. Lima, 2021 (https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1795/)

[9] Since no official estimates of maternal mortality ratio have been released by the government we will focus on the reported deaths by the epidemiological surveillance system, managed by the Ministry of Health (https://www.dge.gob.pe/epipublic/uploads/asis-sala/asis-sala_202130_10_083112.pdf).

[10] https://web.ins.gob.pe/es/covid19/secuenciamiento-sars-cov2

Table 1. Comparison of third wave COVID-19 pandemic scenarios

Variable of interest	Ministry of Health of Peru[11,12]	Institute of Health Metrics and Evaluation (IHME)[13]	Imperial College[14]
Timeframe	Not specified, neither start nor end, other than in journalistic accounts (starting by September 2021, up to June 2022)	Updated weekly, current projections up to December 1st 2021	Updated biweekly, up to January 1st 2023
Methodological rationale	Not described	Excess mortality is influenced by six drivers of all-cause mortality: a) the excess COVID-19 death rate; b) the increase in mortality due to needed health care being delayed or deferred during the pandemic; c) the increase in mortality due to increases in mental health disorders; d) the reduction in mortality due to decreases in injuries; e) the reductions in mortality due to reduced transmission of other viruses; and, f) the reductions in mortality due to some chronic conditions, that occur when frail individuals who would have died from these conditions died earlier from COVID-19 instead.	The model is fitted to the reported daily cases and deaths by allowing three parameters to vary: the start date of the epidemic, the initial R0 in the absence of intervention and the effect size of changes in mobility on transmission. Includes the effect of vaccination, and counterfactual estimation of the effects of vaccination on averted deaths.
Geographic disaggregation	Country and departments	National	National
Estimated deaths	Conservative: 67.292 Worse: 115.189	From August 11, 2021: 12.625 more deaths	From August 11th through 15th March 2022 (when deaths are projected to be below 10), there would be 10.371 deaths, none day with more than 85 deaths.
Strengths and limitations	Projections made by national institutions, for both national and departments, lack of transparency, assumptions and statistical uncertainty intervals	Estimations and projections based and reported on national averages, uncertainty interval of 95%, not necessarily informed by national insights	Estimations and projections based and reported on national averages, uncertainty interval of 95%, not necessarily informed by national insights

[11] https://larepublica.pe/sociedad/2021/08/10/coronavirus-en-peru-tercera-ola-se-extenderia-por-nueve-meses-y-generaria-mas-de-115000-fallecidos/
[12] https://elcomercio.pe/peru/covid-19-tercera-ola-se-extenderia-por-un-periodo-de-nueves-meses-a-partir-de-setiembre-nndc-noticia/
[13] http://www.healthdata.org/sites/default/files/covid_briefs/123_briefing_Peru.pdf
[14] COVID-19 Scenario Analysis Tool. MRC Centre for Global Infectious Disease Analysis, Imperial College London. www.covidsim.org (https://covidsim.org/v5.20210727/?place=pe) (version 5, July 27, 2021).

3. MATERNAL HEALTH AND MATERNAL MORTALITY IMPLICATIONS OF REVIEWED SCENARIOS

While none of these scenarios and projections take into account maternal mortality, nor they share the same timeframe, some insights can be drawn, which can be complemented by lessons learned from the field and institutional experiences since the early days of the pandemic.

As reported from epidemiological surveillance, quarterly seasonality has been an important feature of maternal mortality during the year 2020, and seemingly a similar pattern has been recorded during this year. Last year, about ten to eleven weekly deaths were recorded during the second and third quarters, the worst of 2020, whereas, about six to seven would be recorded in the first and fourth quarters.

From known projections, the one by the Ministry of Health foresees two scenarios, the conservative and the worse. According to the former, and assuming an alleged timeframe of nine months, an average of seven to eight thousand monthly deaths would occur. If the latter prevails, the figure would almost be twofold. In each case, however, and unlike the year 2020, health providers are already vaccinated, and if required a third dose would be available for them. Pregnant women are already being vaccinated, yet its rate is still slow, so they should be considered a priority to receive the shots. If about forty thousand births occur each month, it must be doubled in order to increase the coverage, an average of 2.000 per day in next four months, better if accelerated during August and September, at least by 3.000.

Other projections are more optimistic, although in the case of the IHME its timeframe finishes by December 1st, when seemingly an upward trend would be starting by then. Next iterations might change projections, including the timeframe, which based in our previous experience may rise sharply, as seen in the year 2020, although under some different circumstances (vaccination, oxygen availability, etc.).

With a longer timeframe, the model developed by the Imperial College generates counterfactual projections of averted deaths by the vaccination. New iterations might eventually change its relatively optimistic scenario. However, beyond a mere numeric exercise, the implications are more complex, as no other relevant consideration has been included, as civil unrest, economic crisis or other social impacts, negatively synergizing the living and other health conditions, which are not inputs of models.

As a reference, we could consider the still preliminary results of annual projections of maternal mortality ratio by 2030, currently under revision. It models two scenarios, one with the impact of the pandemic, the other projecting trends hadn't the pandemic ever occurred (see figure 4 in the Annex). Since the modeling strategy might be biased due to the effect of the disruption from 2019 to 2020, nor does it consider the likely impact of vaccination roll-out. Accordingly, unless a major short-term intervention is implemented (e.g. full vaccination) the scenario is pessimistic. Yet, it would only avert deaths caused by the SARS-CoV-2 virus, not deaths due to competitive risks, or resulting from lack of services, shortage of staff, scarcity of transportation, etc.

4. RECOMMENDATIONS

Along with the Peruvian Society of Obstetrics & Gynecology, UNFPA has approached the new authorities at the Ministry of Health, sharing short and mid-term recommendations, in order to tackle the current upsurge of maternal mortality. Basically the focus is placed on preventing reproductive risk (involving community participation), and the severe forms of SARS-CoV-2 (for which vaccination is key), the timely access to emergency services, state-of-the-art clinical management of obstetric complications (strengthening the ICU network), and updated treatment protocols of severe complications.

Yet, another level of advocacy and field interventions are urgently required. After discussing all implications for maternal mortality, first internally, UNFPA Peru is devoting efforts to inform about all scenarios with partners and stakeholders, both national and at departments. Emphasis in proved short-term interventions, as vaccination would be a leading intervention. While it would only avert deaths caused by COVID-19, other causes remain unaffected. Thus, it should be noted the role of comorbidities, and the death profile by age (30% of them in women aged 30-34) and other sub-national features.

The projections by department should include the variations and profiles of maternal mortality, as well the coverage of vaccination. It implies the need to release available information, in order to further analyzing in depth sub-national patterns and monitor them, including variables of ethnic background. After recovering from the catastrophic effects of the pandemic, Peru urgently needs to recover its track to achieve the SDG by the year 2030, a priority also at the very core of UNFPA Country Program 2022-2026.

5. ANNEXES

Figure 1. Daily deaths in Peru, March 1, 2020 to December 1, 2021

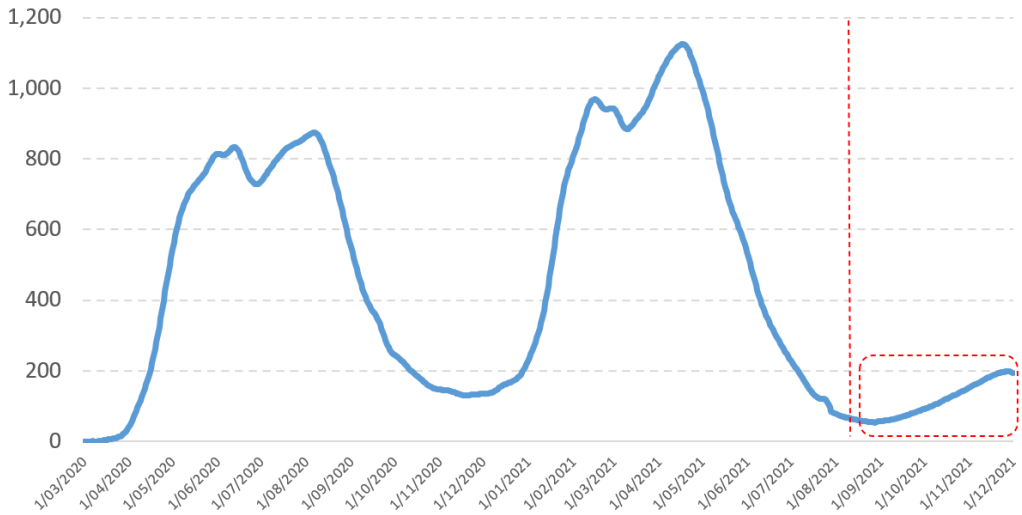
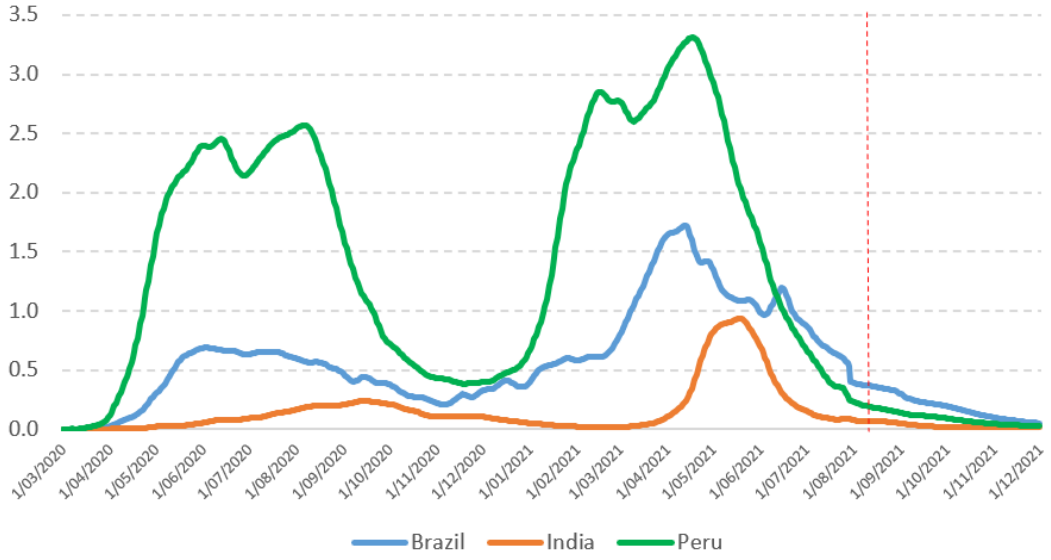
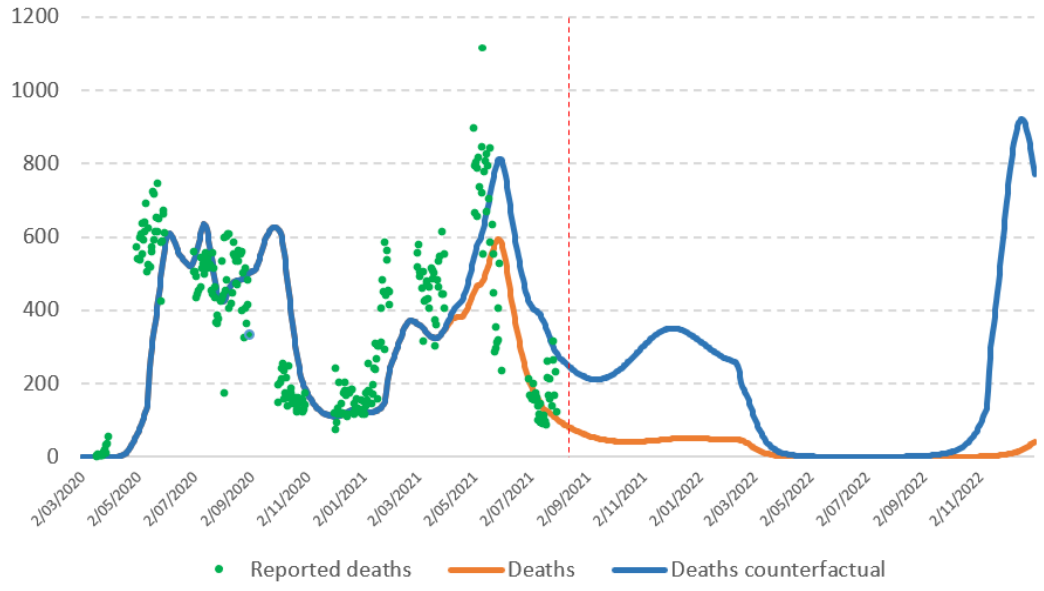


Figure 2. Excess daily deaths (per 100.000): Brazil, India and Peru, March 1, 2020 to December 1, 2021



Source: Elaborated from[15]

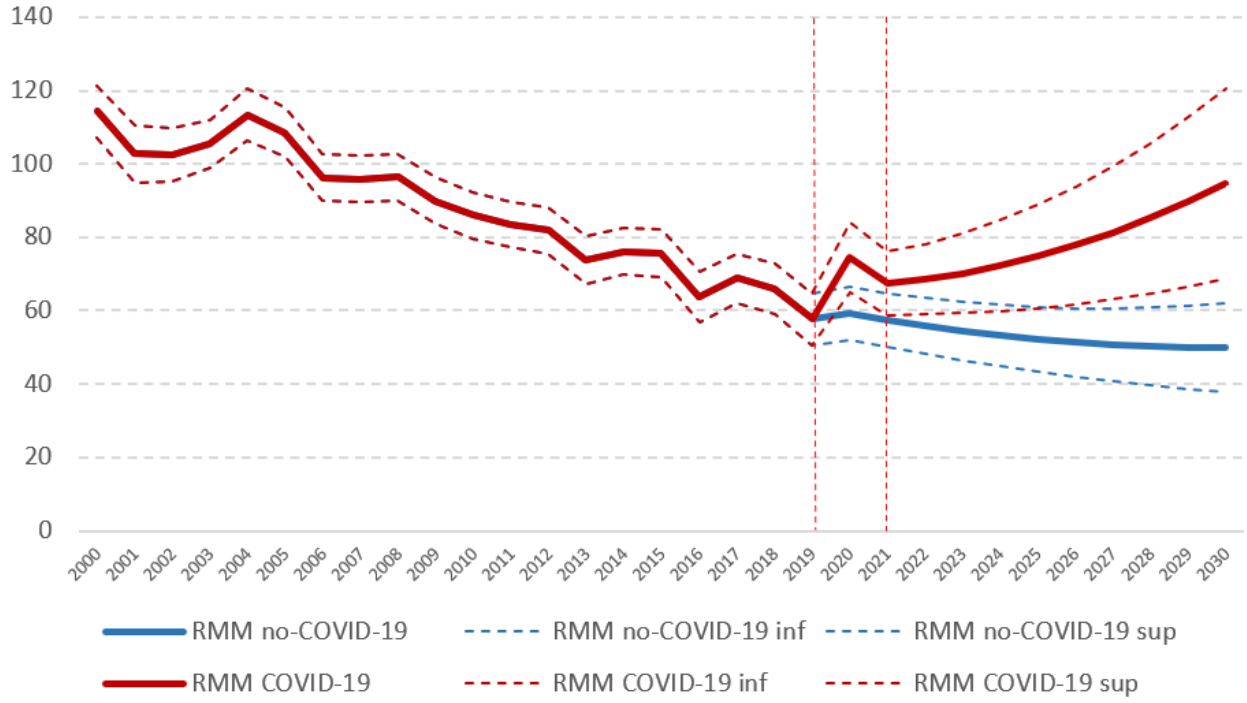
Figure 3. Epidemic trajectory for Peru, March 2, 2020 to December 31, 2022 (Imperial College model)



Source: Elaborated from[13]

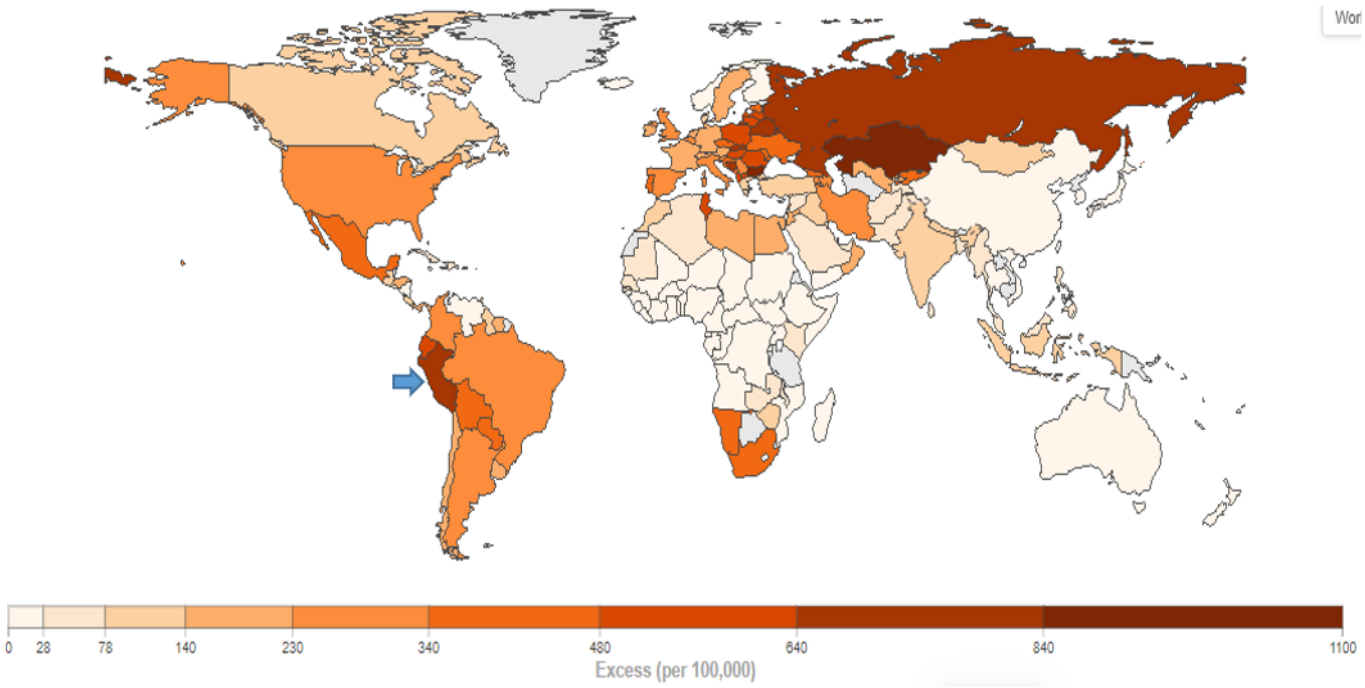
15 Institute for Health Metrics and Evaluation (IHME). COVID-19 Mortality, Infection, Testing, Hospital Resource Use, and Social Distancing Projections. Seattle, United States of America: Institute for Health Metrics and Evaluation (IHME), University of Washington, 2020.

Figure 4. Peru 2000 – 2030: Estimates and counterfactual projections of MMR (COVID-19 and no-COVID-19)



Source: Preliminary results of MINSA-CDC/UNFPA, maternal mortality estimates and projections, 2000 – 2030

Map 1. Cumulative deaths, as of August 13, 2021 (current projection)



Source: https://covid19.healthdata.org/global?view=cumulative-deaths&tab=map