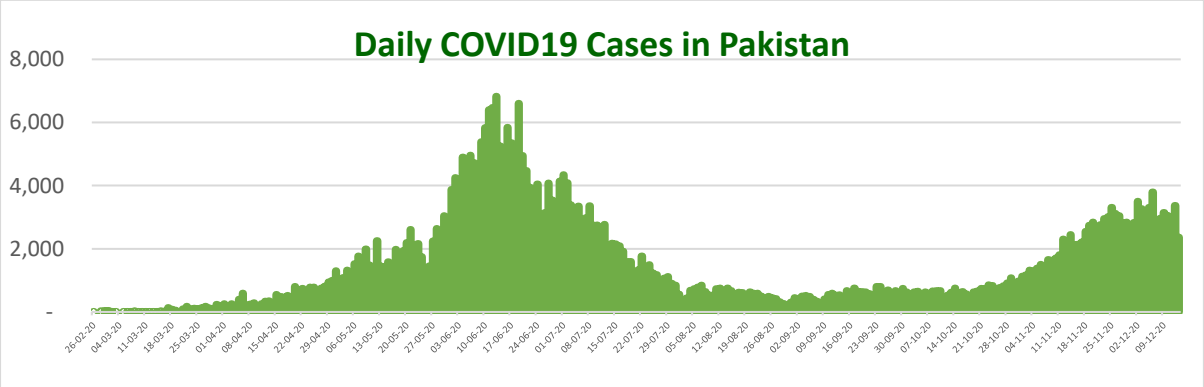
Measuring Impact of Mitigation Measures during COVID19 pandemic in Pakistan: Maternal, New-born and Child Lives Lost and Saved

Background

During 2020, as a result of the COVID-19 pandemic, essential health service delivery declined throughout the world with the effects more profoundly observed in low-income countries.[1] By the end of 2020, more than 87 million individuals across the world had become infected with COVID-19 resulting in 1.8 million deaths. By December 31, 2020, Pakistan had reported 482,178 cases of COVID-19 and 10,176 deaths amongst its population.[2] The COVID-19 pandemic has challenged health systems with an increased burden of COVID-19 patients requiring acute and intensive care and limiting the capacity of health systems to provide routine services. Moreover, other non-pharmacological interventions, such as lockdowns and social distancing,[3] which were implemented in many countries to slow the spread of COVID-19, limited the mobility of populations, and led to reduced utilization of essential health services.[4]

Figure1. Daily COVID 19 cases and pattern of epidemic in Pakistan during 2020



RMNCAH Services in Pakistan during the Pandemic

In Pakistan, essential health services, including reproductive, maternal, neonatal, and adolescent health (RMNCAH) services, were disrupted due to COVID-19.[5] Disruption occurred because of supply side issues such as shortages of Personal Protective Equipment (PPEs), closure of health facilities due

[1] World Health Organization. Pulse survey on continuity of essential health services during the COVID-19 pandemic: interim report. WHO; 2020. Available from: https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS_continuity-survey-2020.1

[2] Government of Pakistan. Pakistan Cases Details. Covid 19: Overview. Available from: https://covid.gov.pk/stats/pakistan.

[3] Ferguson NM, Laydon D, Nedjati-Gilani G, et al. Impact of nonpharmaceutical interventions (NPIs) to reduce COVID19 mortality and healthcare demand. London: WHO Collaborating Centre for Infectious Disease Modelling MRC Centre for Global Infectious Disease Analysis Abdul Latif Jameel Institute for Disease and Emergency Analytics Imperial College London; 2020

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[5] World Health Organization. Pakistan's drive to restore essential health services during COVID-19. WHO; 2020. Available from: https://www.who.int/news-room/feature-stories/detail/pakistan-s-drive-to-restore-essential-health-services-during-covid-19

to lockdowns, and health facility staff and equipment shortage.[6, 7] Other causes of disruption included reduced health services utilization as a result of patients who opted to defer health facility visits due to fear of exposure to the virus, disruption of transport services, and poor affordability due to unemployment brought on by the lockdowns.[8, 9, 10]

Mitigation Measures

Pakistan responded to the challenges imposed by COVID-19 by adopting several mitigation strategies, aimed at reducing the transmission of COVID-19, while simultaneously making efforts to restore the delivery of essential health services. Overall, the Government of Pakistan, with assistance from partner organizations, implemented seven broad categories of mitigation measures, which included 1) hygiene & social distancing measures, 2) health education measures, 3) social protection measures through cash transfer scheme for the poorest people, 4) increased provision of telehealth, 5) increased support for community-based health services, 6) increased human resources/ task shifting and supplies for health services, and 7) media campaigns.

Hygiene and social distancing mitigation measures included the procurement and provision of face masks and other personal protective equipment (PPE) to frontline health care workers[11], establishment of handwashing stations in hospitals, clinics, and laboratories, with posters displaying correct methods for handwashing, and compulsory thermal screening of patients entering health facilities and implementing social distancing measures.[12]

Health education mitigation measures included the development of a website (www.covid.gov.pk) to educate the population on the symptoms of COVID-19 infection, methods to reduce transmission, up-to-date information on the situation of COVID-19 in the country (i.e., cases/deaths), health facility locations where routine services could be safely sought, and standard operating procedures related to quarantine and travel etc. Finally, the Ministry of National Health Services, Regulations and Coordination (NHSR&C) adapted WHO Guidelines for obstetric and paediatric care in context of the COVID-19 pandemic and conducted trainings with health care workers, which were held online as well as in-person. [8, 31]

To mitigate the devasting impacts suffered by wage earners who were laid off because of the COVID-19 lockdowns, the Government of Pakistan provided financial support to eligible citizens through the

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[7] Voice of America. Coronavirus Infects 480 Pakistani Health Workers, Kills 3 Doctors. Available from: https://www.voanews.com/covid-19-pandemic/coronavirus-infects-480-pakistani-health-workers-kills-3-doctors

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[10] Rasheed R, Rizwan A, Javed H, Sharif F and Zaidi A. Socio-economic and environmental impacts of COVID-19 pandemic in Pakistan—an integrated analysis. Environ Sci Pollut Res 2021: 1–18. doi: 10.1007/s11356-020-12070-7 [Epub ahead of print]

[11] Muslim Hands COVID 19 response in Pakistan. Available from: https://reliefweb.int/sites/reliefweb.int/files/resources/V9-COVID-19%20Response%20by%20Muslim%20Hands%20in%20Pakistan.pdf

[12] Noreen N, Dil S, Niazi SUK, Naveed I, Khan NU, Khan FK, et al. COVID 19 Pandemic & Pakistan; Limitations and Gaps. Global Biosecurity. 2020;1(4): None. DOI: http://doi.org/10.31646/gbio.63

EHSAAS Emergency Cash Program, through which 12 million families received a relief package of PKR 12,000, a portion of which we assume was used for accessing medical care.[13, 14]

During the pandemic, telehealth centres were set up at medical colleges/ individual levels for online consultations for people who had access to internet or cell phone coverage. These services were established as an extension of existing e-health clinics that have provided remote RMNCH services and capacity building support for health workers for over 10 years.[15]

At the community level, community-based cadres of Lady Health Workers (LHWs) and Community Midwives (CMWs) were engaged with ensuring that critical cases of COVID-19 in the community were linked with health care providers. In addition to their regular duties, these community-based health care workers disseminated information regarding preventive measures and facilities designated for isolation and quarantine of COVID 19 patients and information regarding the pandemic.

Pakistan has a doctor-population ratio of 0.96 and a nurse/midwife/LHV per 1,000 population ratio of 0.49.[16] At the onset of the pandemic, a total of 194,000 public and private sector medical practitioners were engaged with only 30,000 serving in Intensive care units (ICUs).[20] With the intense pressure and workload on the healthcare community, many out-of-work medical related professionals, especially non-active female physicians, volunteered their services to fill vacant positions of doctors and nurses. In addition, many volunteers joined the "PM Relief Tiger Force" in response to the Prime Minister's call for the youth to provide food rations to the poor and create awareness regarding COVID-19 within communities.[17]

At the onset of the pandemic, the country experienced serious transport restrictions and shortages of commodities, particularly PPE, medicines, contraceptive commodities, and equipment. In response, the government decided to impose a "smart lockdown" to save both lives and livelihoods. The effort was directed towards achieving minimal loss of lives to COVID-19 while preserving livelihoods at the same time.[18, 19, 20] As part of this effort, the government, with the assistance of multiple organizations and development partners, initiated a media campaign stressing the importance of birth spacing, immunization and hygienic measures in the context of COVID-19.[21]

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Methodology:

Benefit-Risk Analysis

As mitigation strategies are being formulated to help continue the delivery of essential health services during the COVOD-19 pandemic, countries need to carefully weigh the benefits and risk of pursuing these strategies. WHO, while attempting to assist countries in their mitigation efforts, has developed a benefit-risk model designed to provide guidance on how to compare the health benefits of sustained essential RMNCAH services (with mitigation measure in place) against the risk of SARS-CoV-2 infections incurred by their populations while utilizing services. The purpose of this article is to describe the application of this model and its findings in Pakistan.

This benefit-risk analysis uses lives saved and lost as the ultimate outcome measure and compares the lives saved through maintaining coverage with essential health interventions with the lives lost due to COVID infections and deaths caused by health services disruption.

This benefit-risk analysis used the Spectrum LiST tool (www.livessavedtool.org), a tool developed to estimate the impact of scaling up essential maternal and child health services on maternal, new-born and child mortality. In this benefit-risk analysis, LiST was used to first estimate the lives lost due to coverage disruption in Pakistan caused by the pandemic. In a second step, the LiST model was used to calculate how many lives could be saved due to mitigation measures implemented by the country. Lives lost due to additional COVID infections and deaths were calculated in a newly developed Excel-based benefit-risk tool analysing all the data for entry into the LiST model, calculated the number of lives lost and lives gained and then tied all the different pieces of the analysis together to calculate benefit-risk ratios for different interventions.

Measuring the Disruption in RMNCAH Service Delivery in Pakistan

To determine the extent of disruption to RMNCAH services caused by COVID-19 in Pakistan, data from the District Health Information System (DHIS) dashboard, established at the Health Policy, System Strengthening & Information Analysis Unit (HPSIU) at the Ministry of National Health Services, Regulations & Coordination was downloaded on monthly basis and analysed. This collated data depicted a rapid decline of health service utilization during the months from March to July 2020, which raised serious concern regarding the impact of the COVID-19 pandemic on essential health service delivery, particularly RMNCH services. For each service package one indicator was selected to represent service disruption for the entire package. Services disruptions are outlined in Table 1.

Table 1. Disruption in the utilization of RMNCAH Service packages considering March-July data for 2019 and 2020

No.	Service Package	Service disruption (Mar-Jul 2020)	Indicator used to measure disruption	Data Source
1.	Family Planning	30%	Family planning visits	DHIS Data
2.	Antenatal Care	31%	Number of 1st Antenatal Visit	DHIS Data
3.	Delivery Care	19%	Births at the facilities regardless of outcome	DHIS Data

4.	New-born Care	18%	Live births at Facility	DHIS Data
5.	Breastfeeding	18%	Live Births at Facility	DHIS Data
6.	Vaccines	26%	DPT-3 doses delivered	DHIS Data
7.	Child Health	33%	Treatment for diarrhoea	DHIS Data

The following data was collected for the benefit-risk analysis:

a) Key RMNACH services impacted by the COVID-19 pandemic in Pakistan and the proportion of the population requiring these services

b) Baseline coverage of key RMNCAH services (pre-COVID during 2019)

c) Mitigation strategies to increase coverage of essential health services and reduce transmission of COVID-19 that were implemented or planned for implementation in Pakistan during 2020.

Baseline coverage data for this benefit-risk analysis was extracted from default data generated in the Spectrum model from the DEmProj and LiST modules (v. 5.89). After extraction, baseline coverage data were reviewed by the Pakistan benefit-risk analysis team and, where appropriate, updated with more recent 2017 Census data and other surveys.

To determine disruption of RMNACH services during the COVID-19 pandemic, monthly data were collated for key indicators for the years of 2019 and 2020. Data from 2019 were compared to data for the months of March to July 2020, during which the greatest disruption in services were observed. A summary of 2019 and 2020 disruption data collected for this benefit-risk analysis is included in Annexure III.

Each mitigation strategy was assessed on the impact it would have on reducing the risk of SARS-COVID-19 infections as well as on restoring coverage of the intervention it was targeting (e.g., antenatal care, immunization). Information gathered from partners on the mitigation measures was used for this purpose in addition to cross-country deliberations. The impact of restored coverage on maternal, new-born and child mortality were then calculated using the Lives Saved Tool (LiST).

The risk of SARS-CoV-2 infection incurred by women and children accessing care well as mortality due to these infections for patients and their families was estimated using an approach adapted from a study carried out by researchers from the London School of Hygiene and Tropical Medicine, which analysed the benefits of maintaining routine childhood immunization during the COVID-19 pandemic. That study estimated the excess risk incurred by women as well as children and their caretakers in their quest to receive immunization services at a health facility during the COVID-19 pandemic (this included the risk of infection during their travel to the facility, waiting and receiving services from a health care provider). That methodology was adapted to apply to all maternal and child-related facility visits, both ambulatory and involving hospitalization.

Results

The overall Benefit-Risk Ratio from this study was found to be 72.9. This means that for 72.9 lives gained due to increased RMNCAH coverage, there was one excess related death due to COVID infection acquired while seeking care.

More specifically, in all cases and for all health packages, the benefit risk ratio was above 1, which means that maintaining services saved more lives than were lost due to additional deaths caused by COVID acquired during contacts with the health system.

This model estimated how many lives were lost due to RMNACH service disruption during the height of the 2020 COVID-19 pandemic without considering mitigation measures. Using the LiST model and applying the average disruption experienced in March-July 2020, it is estimated that because of disruption of services delivery, almost 48,062 child lives were lost (including 20,874 new-born lives) and 440 maternal lives, for a total of 48,502 lives lost. Table 2 details results for lives lost during the period of March to July, 2020. These results were obtained for the disruption period only from the actual results generated by the LiST Model (shown in Table 3) since the model generates values for an entire year. These were calculated by dividing the values in Table 3 by 12 and then multiplying by 5 to get the results for five months from March to July, 2020.

Table 2. Lives Lost expected Due to Disruption in Coverage of Essential RMNCH Services during Mar – July 2020

Intervention Packages	New-born Lives Lost	Child Lives Lost	Maternal Lives Lost	Total Lives Lost
Family Planning	(71)	(75)	30	(45)
Antenatal Care	(3,638)	(3,638)	(69)	(3,707)
Delivery Care	(2,077)	(2,077)	(401)	(2,478)
New-born Care	(8,690)	(8,690)	--	(8,690)
Breastfeeding	(6,130)	(16,914)	--	(16,914)
Vaccines	--	(2,461)	--	(2,461)
Child Health	(269)	(14,208)	--	(14,208)
TOTAL	**(20,874)**	**(48,062)**	**(440)**	**(48,502)**

Table 3. Lives lost expected due to disruption in Coverage of Essential RMNCH services in 2020 considering Mar-July Trend

Intervention Packages	New-born Lives Lost	Child Lives Lost	Maternal Lives Lost	Total Lives Lost
Family Planning	(171)	(180)	73	(107)
Antenatal Care	(8,731)	(8,731)	(166)	(8,897)
Delivery Care	(4,984)	(4,984)	(963)	(5,947)
New-born Care	(20,855)	(20,855)	--	(20,855)
Breastfeeding	(14,711)	(40,594)	--	(40,594)
Vaccines	--	(5,906)	--	(5,906)
Child Health	(646)	(34,098)	--	(34,098)
TOTAL	**(50,098)**	**(115,348)**	**(1,056)**	**(116,404)**

It is estimated that with restored coverage levels of essential health services due to the mitigation measures implemented, 38,104 child lives could been saved (including 18,020 new-born lives) and 424 maternal lives for a total of 38,528 lives saved. Table 4 details results for lives saved as a result of mitigation measures implemented to restore coverage of RMNCAH services during March-July, 2020. The LiST Tool actually calculated the Lives saved for the entire year (Results shown in Table 5), which was then divided by 12 and multiplied by 5 to get the results for the five months from March to July, 2020.

Table 4. Lives Saved expected Due to Mitigation Measures during Mar – July 2020

Intervention Packages	New-born Lives Saved	Child Lives Saved	Maternal Lives Saved	Total Lives Saved
Family Planning	20	21	58	80
Antenatal Care	1,360	1,360	39	1,399
Delivery Care	1,533	1,533	326	1,859
New-born Care	9,666	9,666	--	9,666
Breastfeeding	5,310	14,897	--	14,897
Vaccines	--	2,245	--	2,245
Child Health	131	8,383	--	8,383
TOTAL	**18,020**	**38,104**	**424**	**38,528**

Table 5. Lives Saved expected Due to Mitigation Measures in 2020 considering Mar – July Trend

Intervention Packages	New-born Lives Saved	Child Lives Saved	Maternal Lives Saved	Total Lives Saved
Family Planning	48	51	140	191
Antenatal Care	3,263	3,263	94	3,357
Delivery Care	3,679	3,679	783	4,462
New-born Care	23,198	23,198	--	23,198
Breastfeeding	12,745	35,752	--	35,752
Vaccines	--	5,388	--	5,388
Child Health	315	20,118	--	20,118
TOTAL	**43,248**	**91,449**	**1,017**	**92,466**

Finally, the model compared the number of lives that could be saved due to restored RMNCAH coverage against potential lives lost due to excess COVID-19 infections, i.e. COVID infections resulting directly from women and children accessing services at a health facility. The benefit-risk analysis indicates that while 1,269 lives might be lost due to added COVID-19 infections acquired due to contact with a health facility (as well as travel to and from a health facility) 92,466 lives may be saved due to mitigation measures implemented to increased coverage and reduced transmission of COVID-19, resulting in an overall risk-benefit ratio of 72.9. Table 6 outlines overall and intervention specific benefit-risk ratios developed from this modelling exercise. While benefit-risk ratios varied between packages, for all health packages, the benefit-risk ratio was significantly above 1, which means that

for all packages, maintaining services saved more lives than were lost due to additional deaths caused by COVID acquired during contacts with the health system.

Table 6. Benefit Risk Analysis Considering RMNCH Service delivery

Intervention Packages	Lives Saved through Mitigation Measures	Lives Lost through Added COVID Infections	Benefit-Risk Ratio
Family Planning	191	(5)	38.4
Antenatal Care	3,357	(107)	31.3
Delivery Care	4,462	(85)	52.4
New-born Care	23,198	(50)	466.6
Breastfeeding	35,752	(25)	1,409.5
Vaccines	5,388	(476)	11.3
Child Health	20,118	(520)	38.7
TOTAL	**92,466**	**(1,269)**	**72.9**

The most impactful mitigation measures, when it came to reducing transmission of COVID-19, were found to be hygiene and distancing measures. For the estimation of the impact of these measures, a small, very recent body of literature based on empirical studies was available that helped the country team come up with effectiveness estimate.[22, 23] Face masks were considered the most effective hygiene mitigation measure estimated to reduce transmission of COVID-19 by up to 30% so long as surgical face masks were used and staff were trained to use them. Social distancing was also considered an effective hygiene mitigation measure, with impacts of up to a 10% reduction of transmission of COVID-19. Other hygiene mitigation measures were estimated to have less impact on reducing the spread of COVID-19, including handwashing (5%), ventilation of treatment rooms (5%), temperature screening (2%), and sanitizing frequently touched surfaces (1%).

The exercise identified numerous mitigation measures which might improve coverage of RMNCAH services. Most of them were estimated to have a modest (1-2%) potential to increase coverage of RMNCAH services. Some mitigation measures were estimated to improve coverage due to the possibility that the mitigation measure would increase patients' confidence that a visit to the health centre would be safe, such as visible hygiene and social distancing measures at the facility or education campaigns reassuring the population that health facilities were safe and stressing the importance of continued care seeking even during the pandemic. Other mitigation measures were thought to increase health care coverage by increasing availability of health work force (by involving community-level health workers or task shifting) and enforcing the supply chain. A concerted effort was made to keep estimates conservative and the model included control features to ensure that the impacts of mitigation measures on coverage were modest (e.g., coverage after mitigation was not allowed to increase more than 2% above pre-pandemic coverage levels).

[22] Hill W, Hull S, MacCuspie R. Testing of Commercial Masks and Respirators and Cotton Mask Insert Materials using SARS-CoV-2 Virion-Sized Particulates: Comparison of Ideal Aerosol Filtration Efficiency versus Fitted Filtration Efficiency. Nano Lett, 2020; 20: 7642-7647.

[23] Esposito S, Principi N, Leung CC, Migliori GB. Universal use of face masks for success against COVID-19: evidence and implications for prevention policies. Eur Respir J, 2020: 55(6). https://doi.org/10.1183/13993003.01260-2020

Discussion

This model indicates that the breast-feeding intervention was having the highest benefit-risk ratio of 1,409. High level of institutional deliveries is also linked to early initiation of breastfeeding and counselling. Use of community-based health services and digital communication, resulted in lower number of follow-up contacts with the health facilities, which were beneficial not only against COVID-19 but also against the risk of getting other infectious diseases. Breast-feeding promotion is extremely effective intervention with long-term impacts over 1-2 years and can save large number of new-born lives.

Over last two decades, behaviours related to institutional deliveries including new-born care have seen a significant rise. Before the start of COVID-19, further improvement was observed during first quarter of 2020. Number of new-born care and delivery care declined slowly after the onset of epidemic and these services recovered relatively quickly compared to other services. Benefit-risk ratio of 466 for new-born care is very high and positive. In case of new-born care, rising level of institutional and clean deliveries along with services for new born resuscitation and treatment of new-born sepsis are highly effective interventions.

Benefit-risk ratio of 52 for delivery services also refer to one of the highest impact ratios as a result of institutional deliveries, acute management of third stage of labour. C-section rate, which has risen very high over last two decades, has shown a declining trend in 2020 since COVID-19 but still quite high.

Other interventions with lower ratio, are still judged with positive benefit-risk ratios. Child health was having positive benefit-risk ratio of 38 but mainly as a result of lock-down and school closure, thus leading to lesser exposure to infections. Another evidence is significant decline in measles and other infections among children during 2020. Transfer of childcare services and improvement in medicines and supplies offer a chance for further improvement of child services and confidence of community.

Family planning and antenatal care visits were avoided the most. Timely recognition of pregnancy complications as a result of less antenatal care visits led to increased risk situation. In case of family planning use of long-term methods (injectable) was observed replacing short-term methods (oral contraceptive pills). Again, community-based services could be beneficial to ensure a resilient and effective health delivery system during emergency situations/ epidemics.

Vaccine services have low but positive benefit-risk ratio as disruption was temporary, recovered quickly and impact calculated is for one year, in which herd immunity does provide protection.

No empirical published data was available on mitigation measures improving RMNCAH coverage. Most measures appear to work through restoration of confidence of population in safety of health facility visits. Some measures increasing RMNCAH coverage could result through the fixing of health system gaps (staff, supplies).

Limitations

The presented risk-benefit analysis has numerous limitations. Due to the recent and constantly shifting nature of the COVID-19 pandemic, not much empirical evidence is available to assist in making the estimates used in this risk-benefit analysis. While data estimates related to the disruption in coverage were relatively easy to obtain and only limited by the quality and completeness data available from the health information system in Pakistan, estimates on the effectiveness of mitigation measures was harder to obtain.

Most difficult was the estimation of the impact that specific mitigation measures would have on coverage (i.e., utilization of health services). There is no literature at all on this, and no evaluation has been done at this time of how mitigation measures instituted in 2020 have affected coverage of essential RMNAH services. Estimates used in this risk-benefit analysis were based on expert opinion, observations and review of mitigation measures reported by partners. Some mitigation measures were estimated to improve coverage due to the possibility that the mitigation measure would increase patients' confidence that a visit to the health centre would be safe, such as visible hygiene and social distancing measures at health facilities or education campaigns reassuring the population that health facilities were safe and stressing the importance of continued care seeking even during the pandemic.

A concerted effort was made to keep mitigation measure estimates conservative and the model did include some control features to ensure that results reflected a realistic assumption (e.g., coverage after mitigation was not allowed to increase more than 2% above pre-pandemic coverage levels)

Slightly easier, but still not well documented was the estimation of how mitigation measures might affect the risk of infection of virus transmission at a health facility. While there is some limited empirical data at this point, even the estimates for the effectiveness of wearing masks, now one of the most widely used measures, is still subject of debate and ranged from 5% to 95%.

Limitations of the LiST Model:

The analysis used the LiST model to estimate how many lives would be lost due to disrupted coverage and how many lives would be saved with coverage restored through mitigation measures. The LiST model uses verified empirical data on the effectiveness of health interventions in preventing mortality. The model, though, was originally designed to estimate the impact of gradually increasing coverage and has not previously been used to calculate disruption of essential health services. In this risk-benefit analysis, we used LiST to model a disruption of coverage followed by a partial or full return of coverage. Since the model is set up as an annual model, we were forced to conduct two separate LiST scenarios, one with mitigation and one without mitigation, and input results from these scenarios into the Excel model, where overall risk-benefit results were calculated. This is a new application of the LiST model.

Conclusion

The study concludes that for health services packages, maintaining services saved vastly more lives than were lost due to additional deaths caused by COVID acquired during contacts with the health system. Therefore, policy makers should emphasize the importance of routine health service delivery and encourage people to utilize them while adopting recommended precautions and measures.

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The team do not have any conflict of interests to report.

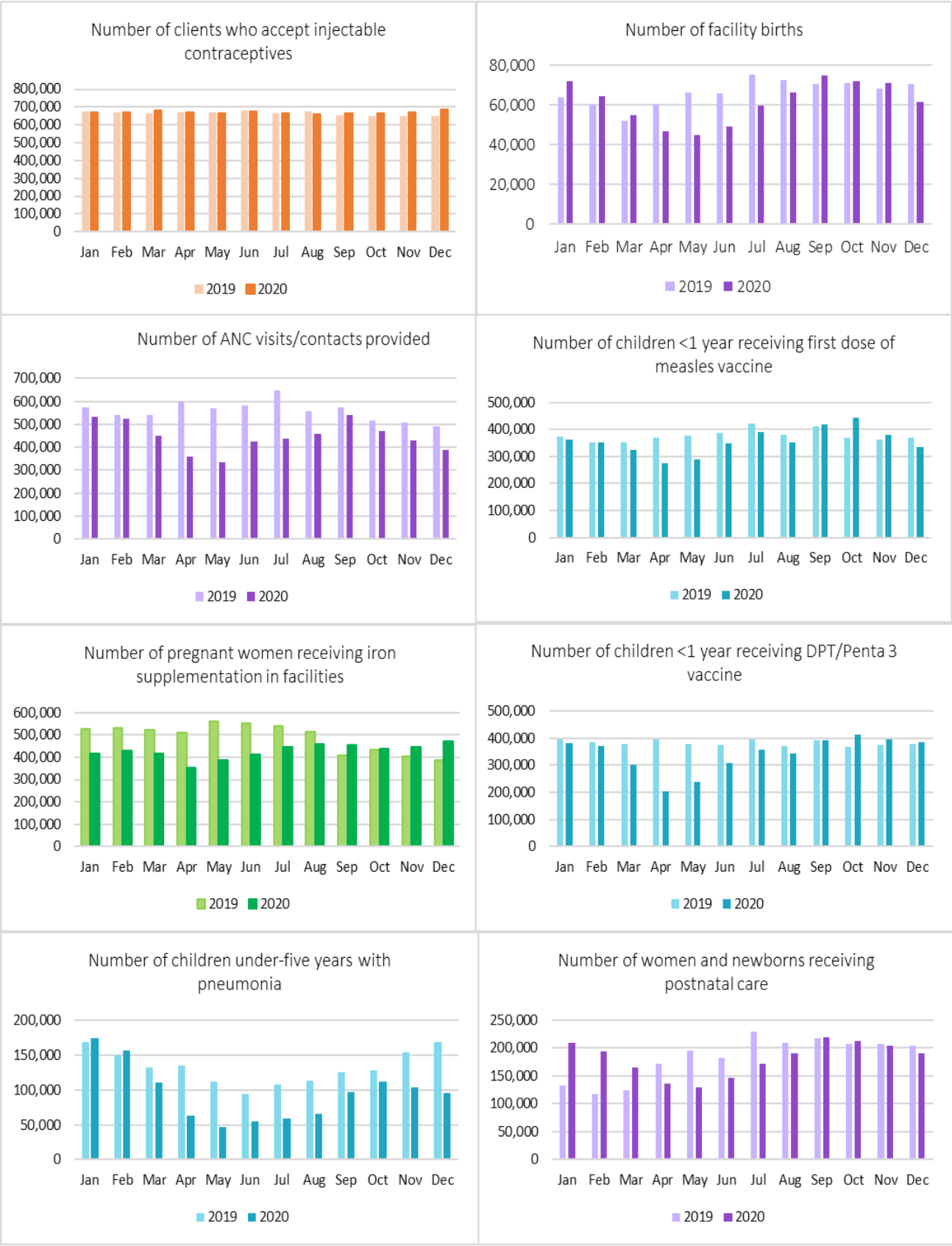
Annexures

Annexure I: RMNCH Services included in the Analysis

Family Planning	FP – Pills
	FP – Condoms
	FP – Injectables
	FP – Implants
	FP – IUD
	FP - Female Sterilization
	FP - Male Sterilization
	FP - Traditional Methods
Antenatal Care	TT - Tetanus toxoid vaccination
	IPTp - Intermittent preventive treatment of malaria during pregnancy
	Syphilis detection and treatment
	Calcium supplementation
	Iron and folate supplementation in pregnancy
	Multiple micronutrient supplementation in pregnancy
	Balanced energy supplementation
	Hypertensive disorder case management
	Diabetes case management
	Malaria case management
	MgSO4 management of pre-eclampsia
Delivery Care & EmOC	Health Facility Delivery
	Clean birth environment
	Manual removal of placenta
	MgSO4 management of eclampsia
	Antibiotics for preterm or prolonged PROM
	Parenteral administration of antibiotics
	Assisted vaginal delivery
	Active management of third stage of labour (AMTSL)
	Removal of retained products of conception
	Induction of labour for pregnancies lasting 41+ weeks
	Antenatal corticosteroids for preterm labour
	Maternal sepsis case management
	Safe abortion services
	Post abortion case management
	Caesarean delivery
	Blood transfusion
	Ectopic pregnancy case management
New-born Care	Immediate drying and additional stimulation
	Thermal protection
	Clean cord care
	Neonatal resuscitation
	Case management of premature babies
	Kangaroo-Mother Care (KMC)
	Full supportive care of prematurity

	Case management of neonatal sepsis/pneumonia
	Oral antibiotics for neonatal sepsis
	Injectable antibiotics for neonatal sepsis
	Full supportive care for neonatal sepsis/pneumonia
Breastfeeding	Early Initiation of Breastfeeding
	Complementary feeding - Education only
	Complementary feeding - Supplementary feeding + Education
Vaccines	BCG - Single dose
	Polio - Three doses
	Pentavalent
	DPT - Three doses
	Hib - Three doses
	Hep B - Three doses
	Pneumococcal - Three doses
	Rotavirus - Two doses
	Meningococcal A - Single dose
	Malaria vaccine - Three doses
	Measles - Single dose
Child Health	Vitamin A supplementation
	Zinc supplementation
	ORS - Oral Rehydration Solution
	Antibiotics for treatment of dysentery
	Zinc for treatment of diarrhoea
	Oral antibiotics for pneumonia
	Vitamin A for treatment of measles
	ACTs - Artemisinin compounds for treatment of malaria

Annexure II: Trend in provision of Essential RMNCH services in 2020 compared to 2019



Annexure III: Baseline Coverage (Pre-COVID)

Key Health Interventions	Name in Spectrum Download	Target Population	% Requiring Intervention	Note	No. Requiring Intervention 2019
FP – Injectables	FP - Injectables	Married WRA	2.6%	% of Women Using	852,864
FP – Pills	FP - Pills	Married WRA	1.8%	% of Women Using	579,948
Antenatal care (at least 1 visit)	Antenatal care (at least 1 visit)	Pregnancies	100.0%	All pregnant women	8,845,004
Health Facility Delivery	Health Facility Delivery	Births	100.0%	All births	6,132,393
Early Initiation of Breastfeeding	Early Initiation of Breastfeeding	Births	100.0%	All new-borns	6,132,393
DPT - Three doses	DPT - Three doses	Children < 1 yr	100.0%	All children	6,132,393
Zinc for treatment of diarrhoea	Incidence of diarrhoea	Children < 5 yr	2.2%		134,913

Annexure IV: Coverage disruption due to COVID (March-July 2020)

	Indicator Used	Avg: Coverage Mar-July 19	March	April	May	June	July	Avg: Coverage Mar-Jul 20	Disruption with COVID19
Family Planning	Oral Contraceptive	747,327	745,301	733,072	725,350	719,012	723,895	729,326	**(2.4%)**
	Injectable	668,823	678,358	667,753	667,173	672,917	666,802	670,601	**(0.3%)**
Antenatal Care	ANC 1 Coverage	587,629	451,112	359,677	335,050	425,976	439,312	402,225	**(31.6%)**
Delivery Care	Facility Delivery	63,822	54,953	46,854	45,049	49,062	59,367	51,057	**(20.0%)**
Breastfeeding	Live Births	63,822	54953	46854	45049	49062	59367	51,057	**(20.0%)**
Vaccines	DPT/ Penta 3 vaccine	384,560	301,927	204,522	240,086	309,112	358,833	282,896	**(26.4%)**
Child Health	Diarrhoea U5	655,130	439,510	409,459	400,557	423,324	449,827	424,535	**(35.2%)**

Annexure V: Mitigation Measures and Estimated Impact

	Impact on Infection Risk				Impact on Coverage		
Mitigation Measure	**Reduction in Number of Visits per Person per Intervention**		**Reduction in Disease Transmission Risk in the remaining visits**		**Increase in Coverage compared to current Coverage Level**		**Applicable to:**
Hygiene and Distancing Measures							
Carry out temperature screening of all patients before patients enter the health facility	**0%**	This has no impact on the average number of visits per person per intervention	**2%**	Makes visits safer by screening out patients with fever and protecting those without COVID but impact is limited as people are the most contagious 2 days before showing symptoms like fever.	**2%**	Might increase coverage a bit for essential health services as public will have more trust on safety of healthcare during the epidemic.	All services
Use of Masks by i) patients and ii) healthcare staff	**0%** **0%**	This has no impact on the average number of visits per	**20%** **50%**	As COVID19 patients have to visit health facilities/ hospitals, the use of masks by all	**2%** **2%**	Strict hygiene protocol might ensure confidence in population that	All services

		person per intervention		visiting health facilities/ hospitals will significantly reduce the disease transmission risk		health facilities are safe to visit	
Provide access to handwashing facilities and supplies in health facilities	**0%**	This has no impact on the average number of visits per person per intervention	**5%**	Handwashing is one of the most important measures to limit spread of COVID-19. Hand washing will reduce spread by reducing hand to mouth/nose /eye transmission and will increase awareness of the need for a clean environment to reduce the spread of COVID-19	**2%**	A strict hygiene protocol related to handwashing might ensure confidence in population that health facilities are safe to visit	All services
Filling of vacant seats of doctors and nurses	**0%**	Increase in the number of filled vacancies will improve confidence of patients and visits will increase	**0%**	This will have no effect on transmission of infection	**5%**	Might increase coverage of interventions now provided in package for which population might not have sought care	All services
Re activation of Lady health workers for household visits and linking critical cases with health care providers through digital communication + track, trace and quarantine0%	**0%**	This has no impact on the average number of visits per person per intervention	**0%**	This will have no effect on transmission of infection	**5%**	Improved coverage due to coordination services provided by LHWs	Country wide
School closure	**0%**		**0%**	Reduction in risk of transmission due to reduced contact among schoolchildren	**0%**	No effect on coverage	Public and private schools
Financial support							
Prime Minister's Relief package	**0%**	Reduced number of visits due to online consultations	**0%**	No effect on risk of transmission due to decreased number of visits	**1%**	Might increase coverage of interventions now provided for which population might not have sought care during the pandemic	For those registered in Ehsaas program (below poverty line)
Information Dissemination and e-Health							
Promote use of digital technologies	**10%**	This intervention led to less reporting of cases at health facilities as services	**0%**	This will have no effect	**1%**	Might increase coverage of interventions	For all population
Media campaign	**0%**	This has no impact on the average number of	**0%**	This will have no effect on transmission of infection	**2%**	Might increase coverage of interventions now provided in	For all population

		visits per person per intervention				package for which population might not have sought care during the pandemic	
SOPs/ Guidelines for obstetric care services in the wake of COVID 19	**0%**	This has no impact on the average number of visits per person per intervention	**5%**	Effect on reduction in transmission risk due to strict adherence to SOPs for IPC	**2%**	Strict hygiene protocol might inspire confidence in population that health facilities are safe to visit	For All services
Capacity Building of Health workers							
Training of Health workers in IPC other trainings relevant to COVID 19	**0%**	This has no impact on the average number of visits per person per intervention	**2%**	Reduced transmission of infection due to improved capacity of HCPs	**2%**	Strict hygiene protocol might inspire confidence in population that health facilities are safe to visit	