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Service disruptions, trauma and burnout during the COVID-19 pandemic among healthcare providers delivering immunisation and maternal and child health services in Indonesia

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ABSTRACT

Background The COVID-19 pandemic resulted in extreme strain on health systems including the health workforce, essential health services and vaccination coverage. We examined disruptions to immunisation and maternal and child health (MCH) services, concerns of personal well-being and delivery of healthcare during the pandemic as well as factors associated with self-reported trauma or burnout among healthcare providers (HCPs).

Methods In March–April 2022, we conducted a cross-sectional survey among HCPs in two provinces of Indonesia. HCPs involved in COVID-19 or routine immunisation and MCH services were randomly selected from district/city health office registration lists. We descriptively analysed service disruptions experienced by HCPs as well as trauma, burnout and concerns of personal well-being and delivery of healthcare during the pandemic. Multivariate logistic regression analyses were undertaken to identify factors associated with trauma or burnout.

Results We recruited 604 HCPs. Mobilisation of staff from routine health services to COVID-19 response duties was a key reason for service disruptions (87.9%). Strategies such as community outreach and task shifting were implemented to overcome disruptions. Trauma or burnout during the pandemic was reported by 64.1% HCPs, with 23.5% reporting worse mental or emotional health. Factors associated with trauma or burnout included delivery of COVID-19 immunisation (adjusted OR (aOR) 2.54, 95% CI 1.08 to 5.94); and delivery of both COVID-19 immunisation and routine immunisation compared with no involvement in vaccination programmes (aOR 2.42, 95% CI 1.06 to 5.52); poor treatment in the workplace (aOR 2.26, 95% CI 1.51 to 3.38) and lower confidence to respond to patient queries on COVID-19 immunisation (aOR 1.51, 95% CI 1.03 to 2.22).

Conclusion HCPs experienced service disruptions, trauma and burnout and implemented strategies to minimise disruptions to service delivery and improve patient experiences. Our study highlights the need to ensure that workforce resilience and strategies to protect and support HCPs are considered for pandemic planning, preparedness and management.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Routine immunisation and maternal and child health services were severely disrupted during the COVID-19 pandemic.
⇒ These service disruptions resulted in extreme strain on the health systems including the health workforce.

WHAT THIS STUDY ADDS

⇒ This study provides new insights into the perspectives and experiences of healthcare providers (HCPs) delivering essential routine services during the pandemic.
⇒ These HCPs work at the subdistrict to village level, providing critical insights at the grass-roots level (ie, *puskesmas* and *posyandu*) in two provinces during the pandemic in Indonesia.
⇒ Numerous service disruptions due to the COVID-19 pandemic, including redeployment of staff to COVID-19 relief and lower caregiver attendance to services were experienced by HCPs.
⇒ Over a third of HCPs reported being treated poorly by community members in the workplace and nearly two-thirds reported trauma or burnout during the pandemic.
⇒ HCPs had increased odds of trauma or burnout if they reported being involved in the delivery of COVID-19 or routine immunisation services, were treated poorly in the workplace or had lower confidence in their ability to respond to patient questions about COVID-19 vaccines.

INTRODUCTION

Indonesia is one of the most populated countries in Southeast Asia and was significantly impacted by COVID-19, directly and through

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Despite constraints during the pandemic, HCPs demonstrated innovation and resilience in the workplace by designing local strategies to minimise service disruptions.
⇒ These findings highlight that workforce planning should be prioritised for pandemic planning.
⇒ Furthermore, it is important for Indonesian and global policymakers to consider the support system for HCPs as part of future pandemic preparedness and planning.

indirect effects on the broader health system.[1] Indonesia has a decentralised health system that grants district-level governments considerable autonomy to deliver healthcare services.[2] This impacts availability and quality of services, as well as the capacity of local governments and the workforce to deliver care.[2] As a result, Indonesia's health system was already experiencing challenges in service delivery when the COVID-19 pandemic was declared. Early in the pandemic, many essential services in Indonesia were interrupted or ceased operation. Health services were further hampered by the diversion of facilities and health workforce to the COVID-19 response.[1 3 4] Social distancing, lockdowns and fear of contracting COVID-19 were key barriers that contributed to reduced service provision and vaccine uptake.[4 5] Among the services impacted by disruptions were routine immunisation and maternal and child health (MCH) services. Notably, in April 2020, 84% of government health facilities in Indonesia reported significant disruption to routine immunisation services.[1]

MCH services in Indonesia can be classified into three services: antenatal care services, delivery services and services for infants and toddlers, which includes routine immunisation.[2] Healthcare providers (HCPs) working in MCH services often work across these services of which immunisation is a core component.[6] MCH services in Indonesia are provided in various levels of health facilities in Indonesia: in the *puskesmas* (primary healthcare centre) and its networks such as *posyandu* (integrated health post) and *polindes* (village maternity cottage) at the community level.[2] However, during the pandemic, MCH services were centralised from *posyandu* towards *puskesmas* and prioritised for women in their first or third trimester or emergencies. There were limitations on MCH services provided, dwindling number of HCPs and limitation on visitations.[7]

Disruptions across a range of primary healthcare services had a number of negative outcomes for those receiving care.[8] Sick child services experienced over 50% disruption, while routine outreach immunisation services and facility-based immunisation services experienced 5%–25% disruption levels.[8] Other MCH services such as well-child visits, antenatal care, postnatal care and facility-based births experienced 5%–25% disruption levels.[8] For maternal health, the proportion of women accessing four or more antenatal appointments dropped from 89% nationally in 2019 to 75% in 2021.[5] According to WHO/UNICEF estimates of national immunization coverage (WUENIC) data, the proportion of children who received the third dose of diphtheria-tetanus-pertussis, hepatitis B and *Haemophilus influenzae* type b (DTP-HB-Hib3) vaccine dropped from 85% nationally in 2019 to 67% in 2021 and the proportion of children who received first dose of DTP-HB-Hib1 dropped from 90% to 74%, and resulted in increased number of zero dose children in 2021.[9]

The impact on the health workforce globally was also significant. A systematic review of global health workers' turnover intention amid COVID-19 pandemic found that the pandemic resulted in excessive job demands and tumultuous work environments for HCPs.[10] In Indonesia, during the first year of the pandemic, 53 000 health workers were trained in detecting, referring and managing COVID-19 confirmed and suspected cases and 38 000 health workers were trained in infection prevention and control.[5] Despite HCPs reporting institutional barriers and constraints in managing the pandemic, shortages of personal protective gear and infrastructure constraints (eg, patient control and quarantine zones) were faced.[5 11] These challenges contributed to over 1500 recorded deaths among HCPs from COVID-19 infection in Indonesia in the first 18 months of the pandemic.[12]

There is also clear evidence that the COVID-19 pandemic affected the psychological well-being of the health workforce.[13 14] In Indonesia, high rates of depressive symptoms (22.8%), anxiety (28.1%) and burnout (26.8%) were reported among HCPs, particularly those dealing directly with the COVID-19 response.[15–19] Additional studies from Indonesia reported burnout and other psychological distress, contributing to poorer HCP performance and service provision,and increased absenteeism and resignation rates.[15 18] While there is available data on disruptions to immunisation and MCH services during the pandemic, much of the existing data on personal well-being and concerns of delivering healthcare among HCPs in Indonesia comes from hospital-based settings or multiprovince surveys, with a focus on HCPs actively engaged in the COVID-19 response.[13 15 16] There is limited data on the experiences and perceptions of HCPs providing routine services such as immunisation and MCH.

In this study, we aimed to examine the disruption to immunisation and MCH services, concerns of personal well-being and delivery of healthcare during the pandemic as well as factors associated with self-reported trauma and burnout among HCPs during the COVID-19 pandemic, in the two Indonesian provinces of Central Java and West Nusa Tenggara.

METHODS

Study location

This study was conducted in two urban and two rural locations in both Central Java and West Nusa Tenggara.

Locations were purposively selected based on the incidence of COVID-19 at the time of study design, the feasibility to implement the study during the pandemic,[20] and to capture the urban and rural settings across the provinces. In Central Java, the study was conducted in Surakarta, Semarang, Purbalingga and Demak. In West Nusa Tenggara, the study was conducted in Bima City, Mataram, Central Lombok and Sumbawa. Central Java Province is on the island of Java, with a total population of nearly 37 million across 29 districts and 6 cities, making it the third most populated province in the country out of 38 provinces.[21] Health and social services account for 1.4% of the overall workforce and it has the fourth highest Gross Domestic Product (GDP).[22] West Nusa Tenggara Province comprises eight districts and two cities across several of the Lesser Sunda Islands. It has a population of around 5.4 million, with health and social services accounting for 1.5% of the overall workforce.[23 24] It is the 13th most populated province with the 25th highest GDP in Indonesia.[21 23] At the time of data collection, Central Java had 44 908 active cases of COVID-19 while West Nusa Tenggara had 2298 cases. In both provinces however, over 80% of adults had received a first dose of COVID-19 vaccination.[25 26]

During the survey period, certain areas in Central Java were subject to different levels of restrictions. Under level 3 restrictions, the operations and activities of *posyandus* were limited, while under level 4 restrictions, *posyandus* were shut down.[27] Conversely, in West Nusa Tenggara, pandemic restrictions varied between level 1 and level 2. Under these regulations, *posyandus* were permitted to resume operations with enhanced health protocols.[27]

Study design

We conducted a cross-sectional survey among HCPs. Two-stage sampling was used, and the overall sample size was calculated using the formula by Lwanga and Lemeshow for estimating proportions.[28] We applied a design effect=2 to account for variance during multistage survey sampling.[29] The sample size was estimated to be 282 and was rounded to 300 HCPs per province for recruitment purposes. Detailed methodology is reported elsewhere.[30]

We invited HCPs aged ≥18 years including doctors, nurses, midwives (*bidan*) and village midwives (*bidan desa*) from the public and private sectors working across COVID-19 or routine immunisation and other MCH services. For each location, we sourced and used the district/city health office's HCP registration lists to guide recruitment. We applied simple random sampling to this list to identify participants. The number of substitute participants was dependent on the sample size for each group of HCPs based on location.

Questionnaire design and data collection

The questionnaire covered four topics: the impact of COVID-19 on routine immunisation and MCH services; COVID-19 vaccine perceptions; concerns of personal well-being and delivery of healthcare during the pandemic and HCP self-efficacy. Survey items were derived from the validated WHO/UNICEF Behavioural and Social Drivers of COVID-19 Vaccination Healthcare Worker survey and relevant items from other surveys, including the WHO Pulse Survey.[31 32] Within the first topic of the questionnaire, participants who were involved in the provision of routine immunisation were asked several questions on disruptions to these services. Further questions regarding disruptions and strategies to overcome these were in reference to the participant's primary health service of work and did not further differentiate by type of MCH service. Concerns of personal well-being and about delivery of healthcare during the pandemic comprise a number of items which sought to understand HCPs' mental or emotional state (eg, self-reported trauma or burnout), their treatment during service provision by community members and COVID-19-specific concerns about delivery of care such as risk of infection, or confidence to answer questions about the COVID-19 vaccine. Mental and emotional health during the pandemic was measured on a 5-point Likert scale adapted from the CAIR Pandemic Impact Questionnaire.[33] Self-efficacy was measured using the Generalised Self-Efficacy Scale.[20] Self-efficacy is defined as a person's belief about their capability to 'produce designated levels of performance that exercise influence over events that affect their lives'.[34] The questionnaire is available in online supplemental annex 1.

All study materials were translated into Bahasa Indonesia and pilot tested. Cognitive interviews were conducted with seven HCPs in Depok (Jakarta) and Semarang (Central Java) to test the understanding of survey items, which were then modified as needed. An in-person 2-day training, with some virtual presentations, was conducted for field coordinators and enumerators in Depok and at the survey sites. HCPs were interviewed at their place of work using paper-based questionnaires. Data were collected during 21 March–8 April 2022.

Data analysis

Completed paper-based questionnaires were cross-checked by enumerators and field coordinators. Once complete, data were manually entered into EpiData software by research assistants from Universitas Indonesia. Ten per cent of surveys were double entered for quality assurance. For multiple choice questions, enumerators were provided a list of potential responses but did not prompt participants on these. Participants responded independently and enumerators chose the response(s) that were closest to the predefined options.

Descriptive statistics were used to summarise the data by demographic characteristics and key variables related to service disruptions, personal well-being, interpersonal experiences and concerns about delivering healthcare during the pandemic. Demographic characteristics are stratified by urban and rural study locations.

We used logistic regression to examine the relationship between *self-reported trauma or burnout* among HCPs and key independent variables: HCPs' age, involvement

in COVID-19 or routine immunisation, self-efficacy, perception of increased risk of exposure to COVID-19 in workplace, poor treatment in the workplace, stock-outs of COVID-19 vaccines, confidence to respond to patient questions about COVID-19 vaccines, delivery of COVID-19 vaccines taking away from other priorities, number of service disruptions experienced and number of strategies to overcome disruptions experienced. We created a binary variable for *self-reported trauma or burnout*, by recoding the responses (yes=1 and no/not sure=0) to a single item "Would you say you've experienced trauma or burnout related to the COVID-19 pandemic?"

Self-efficacy items were scored using means. *Self-efficacy* was measured using a 10-item scale with four response options on a 4-point scale (not true at all=1; hardly true=2; moderately true=3 and exactly true=4). All scores were totalled and scores ≤30 were labelled as 'moderate self-efficacy' and >30 as 'higher self-efficacy'. Responses were then recoded into a binary variable (moderate self-efficacy=0 and high self-efficacy=1). *Confidence to respond to patient questions about COVID-19* used a single item with four response options; responses were recoded into a binary variable (not at all/a little/moderately confident=0 and very confident=1). *Risk perception* was measured using a single item "Do you feel like your job has increased risk of exposure to COVID-19?" (yes=1 and no=0).

Bivariate analyses were first conducted to examine the association between *self-reported trauma or burnout* and potential associated factors. Factors with a p value of <0.20 or with a known association with *self-reported trauma or burnout* were included in the multivariate regression to estimate adjusted OR (aOR) and 95% CIs. All analyses were conducted using STATA V.16.1.

Study governance and ethical approvals

At the start of the study, we formed a Technical Advisory Group to advice on study design and implementation, including members from the Indonesian Ministry of Health, UNICEF Indonesia and EAPRO Offices, the US Centers for Disease Control and Prevention (CDC), Indonesia CDC and WHO Country Offices and the University of Sydney research team. Key approvals and letters of permission from relevant local and national government authorities were obtained prior to study implementation.

All field activities were carried out in a culturally appropriate manner with locally engaged field teams. As the study was conducted during the pandemic, all field activities were conducted in line with a COVID-19 safety protocol developed by the research team. An author reflexivity statement is available in online supplemental annex 2.

Patient and public involvement

The questionnaire was co-designed by local and international research team members with inputs from the Technical Advisory Group. Study findings were disseminated through the Ministry of Health as well as to participants who requested a summary of results at the time of data collection.

RESULTS

We recruited 604 HCPs (target=600) to participate in the study, 304 (50.3%) were from Central Java and 300 (49.7%) from West Nusa Tenggara). Detailed characteristics of HCPs who participated in the study are presented in table 1. Four hundred and fifty HCPs (74.5%) were from rural areas. Most HCPs were female (84.6%; 511/604), aged 31–50 years (44.5%; 269/604) and held a diploma as their highest level of education (75.5%; 456/604). The majority of HCPs were midwives (40.2%, 243/604) followed by nurses (30.8%, 186/604). Most HCPs had >10 years of experience (56.8%; 343/604). The primary place of work reported by HCPs (78.1%, 472/604) was the *puskesmas* (subdistrict primary healthcare clinic). Of the 604 HCPs, 470 (77.8%) were involved in the delivery of COVID-19 immunisation and 384 (63.6%) were involved in routine immunisation. Additionally, just under 50% provided MCH services such as labour and birth (294/604; 48.7%) or other baby and child service such as growth monitoring (285/604; 47.2%).

Service disruptions experienced by HCPs during the pandemic

All HCPs reported experiencing service disruptions during the pandemic. Among HCPs who provided immunisation services, 62.8% (355/565) reported stockouts of routine vaccines. Of these, 63.9% reported stockouts of inactivated polio vaccine (227/355) (table 2). Just over a third of HCP (35.4%; 214/604) reported stockouts of COVID-19 vaccines. Mobilisation of staff to COVID-19 clinical management was the most reported reason for service disruption (87.9%; 531/604), followed by changes to vaccination policies (60.1%; 363/604). HCPs implemented numerous vaccination strategies to attempt to overcome service disruptions, including community outreach (75.5%; 456/604) and phone calls to parents or caregivers (72.4%; 437/604), among others (table 2).

Trauma, burnout and concerns of personal well-being and delivery of healthcare experienced by HCPs delivering immunisation and MCH services during the pandemic

Of the 604 HCPs, 64.1% (387/604) reported experiencing trauma or burnout during the pandemic; 23.5% (142/604) felt that their mental or emotional health had worsened by the pandemic (table 3). Of those who experienced trauma or burnout, longer working hours were the most common reason (60.2%; 233/387). For interpersonal relations, 35.3% (213/604) reported poor treatment (by the community members) in their workplace because they were health workers. Among them, 23% described patient anger at longer wait times (49/213).

Ninety-three per cent (565/604) perceived an increased risk of exposure to COVID-19 in their workplace, 66.4% (401/604) were concerned about getting sick with COVID-19 and 37.3% (225/604) had heard something worrying about the COVID-19 vaccine. Despite

Table 1 Demographic and work-related characteristics of healthcare providers in Central Java and West Nusa Tenggara, Indonesia, March–April 2022 (n=604)

	Total n (%) N=604	Urban n (%) N=154 (25.5)	Rural n (%) N=450 (74.5)
Location			
Central Java	304 (50.3)	120 (77.9)	184 (40.9)
West Nusa Tenggara	300 (49.7)	34 (22.1)	266 (59.1)
Gender			
Female	511 (84.6)	134 (87.0)	377 (83.8)
Male	93 (15.4)	20 (13.0)	73 (16.2)
Age (years)			
18–30	157 (26.0)	35 (22.7)	122 (27.1)
31–40	269 (44.5)	58 (37.7)	211 (46.9)
41–50	122 20.2)	33 (21.4)	89 (19.8)
51 and older	56 (9.3)	28 (18.2)	28 (6.2)
Educational attainment			
Diploma	456 (75.5)	100 (64.9)	356 (79.1)
Undergraduate/Professional degree	138 (22.8)	48 (31.2)	90 (20.0)
Masters/PhD	10 (1.7)	6 (3.9)	4 (0.9)
Current role			
Doctor	40 (6.6)	22 (14.3)	18 (4.0)
Nurse	186 (30.8)	53 (34.4)	133 (29.6)
Midwife	243 (40.2)	78 (50.7)	165 (36.7)
Village midwife	135 (22.4)	1 (0.6)	134 (29.8)
Years in role			
<2	35 (5.8)	8 (5.2)	27 (6.0)
2 to <5	88 (14.6)	22 (14.3)	66 (14.7)
5 to <10	138 (22.8)	28 (18.2)	110 (24.4)
10 or more	343 (56.8)	96 (62.3)	247 (54.9)
Primary place of work*			
Puskesmas	472 (78.1)	123 (79.9)	349 (77.6)
Poskesdes	42 (7.0)	0 (0.0)	42 (9.3)
Independent midwife practice	33 (5.5)	1 (0.6)	21 (4.7)
Polindes	22 (3.6)	1 (0.6)	16 (3.6)
Pustu	17 (2.8)	23 (14.9)	10 (2.2)
Other	14 (2.3)	0 (0.0)	4 (0.9)
Private clinic	4 (0.7)	6 (3.9)	8 (1.8)
Secondary place of work† ‡			
None	429 (71.0)	126 (81.8)	303 (67.3)
Puskesmas	45 (7.5)	4 (2.6)	41 (9.1)
Poskesdes	21 (3.5)	0 (0.0)	21 (4.7)
Pustu	8 (1.3)	0 (0.0)	8 (1.8)
Independent midwife practice	78 (12.9)	7 (4.5)	71 (15.8)
Private clinic	19 (3.1)	9 (5.8)	10 (2.2)
Other	28 (4.6)	10 (6.5)	18 (4.0)
HCP area of work†			
COVID-19 immunisation	470 (77.8)	120 (77.9)	350 (77.8)

Continued

Table 1 Continued

	Total n (%) N=604	Urban n (%) N=154 (25.5)	Rural n (%) N=450 (74.5)
Routine child immunisation	384 (63.6)	97 (63.0)	287 (63.8)
Antenatal care	376 (62.3)	86 (55.8)	290 (64.4)
Family planning	356 (58.9)	83 (53.9)	273 (60.7)
Postnatal care	338 (56.0)	71 (46.1)	267 (59.3)
Labour and birth	294 (48.7)	56 (36.4)	238 (52.9)
Baby and child services (weighing, vitamin A supplementation, etc)	285 (47.2)	82 (53.2)	203 (45.1)
Other	187 (31.0)	56 (36.4)	131 (29.1)

*Puskesmas—primary healthcare centre; poskesdes—village health post; polindes—village maternity post; pustu—auxiliary health centre.
†Multiple response options allowed.
‡Secondary workplace referred to HCPs working in multiple health facilities.
HCP, healthcare provider.

this, 63.3% (382/604) reported feeling very confident to answer patient questions about the COVID-19 vaccine.

Factors associated with self-reported trauma or burnout

HCPs aged 30 to <40 years had higher odds of self-reported trauma or burnout compared with those aged 18 to <30 years (aOR 1.73, 95% CI 1.06 to 2.83) (table 4). HCPs involved in the delivery of COVID-19 immunisation alone (aOR 2.54, 95% CI 1.08 to 5.94) or COVID-19 and routine immunisation (aOR 2.42, 95% CI 1.06 to 5.52) had higher odds of self-reported trauma or burnout compared with those not involved in any vaccination programme. HCPs who reported poor treatment in the workplace had significantly higher odds of self-reported trauma or burnout compared with HCPs who did not report being treated poorly in the workplace or were not sure (aOR 2.26, 95% CI 1.51 to 3.38). HCPs who were not at all, a little or moderately confident to respond to patient questions about the COVID-19 vaccine had higher odds of self-reported trauma or burnout compared with HCPs who were very confident to respond to questions (aOR 1.51, 95% CI 1.03 to 2.22).

DISCUSSION

In this study, we present perspectives of HCPs on disruption to immunisation and MCH services and concerns of personal well-being and delivery of healthcare during the COVID-19 pandemic in Central Java and West Nusa Tenggara provinces, Indonesia. To the authors' knowledge, this is the first paper to provide these insights into HCP experiences working at the grassroots level (ie, *puskesmas* and *posyandu*) in the delivery of essential routine health services. Self-reported trauma and burnout among HCPs was significant. Several factors were associated with higher odds of self-reported trauma or burnout including poor treatment in the workplace by the community, involvement in delivery of COVID-19 or routine immunisation and confidence to respond to patient questions about COVID-19 vaccine.

Around one in five (20.7%) HCPs reported that COVID-19 immunisation had disrupted other priorities and health services. Other service disruptions included staff mobilisation to COVID-19 response (87.9%), change in vaccination policies (60.1%) and fewer caregivers attending clinics (55.0%). Despite experiencing disruptions, HCPs reported using local solutions to overcome these disruptions including community outreach activities, follow-up phone calls to caregivers and task shifting. Stockout of routine vaccines was reported by 62.8% of HCPs.

Globally, in 2021, when this study was initiated, the vaccination coverage for DTP dose 1 dropped to 86% compared with 90% in 2019.[35 36] In Indonesia, first dose of DTP dropped to 74% in 2021 from 90% in 2019.[35 36] As highlighted in The State of the World's Children 2023,[35] the main reason for this drop in vaccination was disruption to routine health services with overstretched primary healthcare and health systems. Global reports found that already limited resources were redirected from primary care, with 49% (35/72) of countries in the 2021 WHO Pulse survey reporting routine vaccination programmes were being disrupted by the need to respond to the pandemic.[32] Reasons varied across the countries, including challenges related to closure of clinics, lack of medicines, diagnostics and vaccines. Vaccine stockouts across health services were reported previously in Indonesia,[1] but the variation across different types of vaccines suggested province-specific challenges with vaccine supply.[1] Supply issues were also reported in a multicountry study with 8/11 member states in the WHO South-East Asia region.[37] One of the key lessons learnt through the pandemic was its impact on the health workforce, with health worker availability and capacity as a key reason for disruption to health services globally.[13 14 32]

Besides routine immunisation, other MCH services were also impacted by COVID-19 globally. In India in 2021, compared with 2019, antenatal care registration declined 18% and obstetric care declined by 40.9%.[38]

Table 2 Service disruptions to routine immunisation and maternal and child health services experienced during the COVID-19 pandemic by healthcare providers in Central Java and West Nusa Tenggara, Indonesia, March–April 2022 (n=604)

	N (%)
Routine vaccine stockout (n=565)*	
No/Not sure	210 (37.2)
Yes	355 (62.8)
Stockouts for routine vaccines (n=355)*†	
IPV	227 (63.9)
DTP-HB-Hib	191 (53.8)
BCG	136 (38.3)
MR	131 (36.9)
HepB	39 (11.0)
PCV	61 (17.2)
OPV	36 (10.1)
Other	34 (9.6)
Vaccine stockout for COVID-19 vaccines	
No/Not sure	378 (62.6)
Yes	214 (35.4)
Do not stock	12 (2.0)
Formal training in COVID-19 immunisation	
No	287 (47.5)
Yes	317 (52.5)
COVID-19 immunisation disrupted other priorities	
Did not deliver COVID-19 immunisation	72 (11.9)
Not at all/Slightly	407 (67.4)
Moderately	95 (15.7)
Very	30 (5.0)
Service disruptions experienced by HCP†‡	
Staff providing COVID-19 relief	531 (87.9)
Change in vaccination policies	363 (60.1)
Fewer parents/caregivers attending for other reasons	332 (55.0)
Lockdowns hindering parent/caregiver access	211 (34.9)
Closure of service	202 (33.4)
Insufficient PPE	185 (30.6)
Not enough staff	184 (30.5)
Unavailability/Stockouts of vaccines or injecting equipment at health facility	169 (28.0)
Other	23 (3.8)
Strategies to overcome disruptions†	
Community outreach	456 (75.5)
Phone calls to parents/caregivers	437 (72.4)
Task shifting/role delegation	387 (64.1)
Parents/Caregivers seen outdoors from facility	358 (59.3)
Redirection of parents/caregivers to alternative services	230 (38.1)
Government removal of user fees	154 (25.5)
Other (eg, home visits, online consultations)	43 (7.1)

*Only participants who provided routine immunisation services answered this question.
†Multiple response options allowed.
‡100% of respondents reported some type of service disruption.
DTP-HB-Hib, diphtheria-tetanus-pertussis, hepatitis B and *Haemophilus influenzae* type b; HepB, hepatitis B; IPV, inactivated polio vaccine; MR, measles and rubella; OPV, oral polio vaccine; PCV, pneumococcal conjugate vaccine; PPE, personal protective equipment.

In Ethiopia, MCH services were disrupted, and services became inaccessible and low quality. Additionally, HCPs experienced scarcity of personal protective equipment (PPE), increased workload and shortages in resources.[39] Similarly in Indonesia, MCH services experienced challenges in operating, including disruption to services, shortages of human and financial resources, difficulty in travelling and overall closure of health facilities.[40]

Similar to our study, other studies in Indonesia found diversion of staff to the COVID-19 response, as well as challenges with caregiver access to services or fear of attendance, have been reported in other MCH services in Indonesia.[40] Routine MCH services responded proactively throughout the pandemic to minimise the impact of disruptions, demonstrating resilience and motivation. Telemedicine, mobile phone chats and community outreach with door-to-door home visits have been reported as strategies to minimise these disruptions.[40] Overall, there is clear recognition of the need to strengthen primary healthcare and health systems to improve care during routine times and to prevent shocks to essential health services during emergencies. Pandemic plans often focus on responding to the infectious diseases outbreak, and need to consider how to strengthen resilience in the health system to maintain routine services.[41]

A large proportion (64.1%) of the 604 HCPs reported experiencing trauma or burnout during the pandemic, resulting from long work hours (60.2%), shifting work duties (26.9%) and changes in service delivery (23.8%). In our study, 35.3% HCPs reported being treated poorly in the workplace during the pandemic. Health workers who reported poor treatment were at 2.3 times greater odds of experiencing trauma and burnout compared with those who did not experience poor treatment. HCPs involved in delivery of COVID-19 immunisation alone or COVID-19 and routine immunisation had 2.4–2.5 greater odds of burnout compared with HCPs not involved in any vaccination programme. Similarly, those who reported not feeling confident in responding to patient questions about COVID-19 vaccines were at 1.5 times greater odds of experiencing trauma and burnout than those who felt confident to answer questions.

Table 3 Trauma, burnout and concerns of personal well-being and delivery of healthcare experienced by HCPs delivering immunisation and MCH services during the pandemic in Central Java and West Nusa Tenggara, Indonesia, March–April 2022 (n=604)

	N (%)
Experienced trauma or burnout during pandemic	
No/Not sure	217 (35.9)
Yes	387 (64.1)
Reasons for trauma or burnout (n=387)*†	
Long work hours	233 (60.2)
Shifting work duties	104 (26.9)
Changes in service delivery	92 (23.8)
Use of PPE	65 (16.8)
Fear of making family ill	57 (14.7)
Patient distress	55 (14.2)
Fear of illness	52 (13.4)
Other personal factors	10 (2.3)
Other service-delivery factors	18 (4.7)
Other patient-related factors	17 (4.4)
Other	15 (3.9)
Mental/Emotional health worsened by pandemic	
Not at all/Slightly	462 (76.5)
Moderately/Very/Extremely	142 (23.5)
Treated poorly during pandemic	
No/Not sure	391 (64.7)
Yes	213 (35.3)
Description of poor treatment (n=213)*‡	
Patients angered by longer wait times	49 (23.0)
Patient perceptions of COVID-19 or pandemic	42 (19.7)
Patients believe I am a COVID-19 risk	35 (16.4)
Patients angered by request for medical exemption	30 (14.1)
Service delivery issues	21 (9.9)
Patients angered by the vaccine brands offered	21 (9.9)
Other patient COVID-19 fears or stigma	19 (8.9)
Negative perceptions of healthcare providers	10 (4.7)
Challenges with patient adherence to safety protocols	10 (4.7)
Patients angry at service closures	5 (2.3)
Other	15 (7.0)
Self-efficacy	
Moderate self-efficacy	198 (32.8)
High self-efficacy	406 (67.2)
Concern about getting COVID-19	
Not at all/A little concerned	203 (33.6)
Moderately concerned	170 (28.2)
Very concerned	231 (38.2)
Confidence to answer questions about COVID-19 vaccine	
Not at all/A little confident	8 (1.3)
Moderately confident	214 (35.4)
Very confident	382 (63.3)
Heard something worrying about COVID-19 vaccine	
No/Not sure	379 (62.7)
Yes	225 (37.3)
Perception of increased risk of exposure to COVID-19 at work	
No	39 (6.5)
Yes	565 (93.5)

*Multiple response options allowed.
†For those who reported yes to experiencing trauma or burnout during the pandemic.
‡Of those who responded to yes for being treated poorly because they are a healthcare worker.
HCP, healthcare provider; MCH, maternal and child health; PPE, personal protective equipment.

Our finding of HCPs experiencing trauma and burnout and related factors are not surprising. Prior to the COVID-19 pandemic, some studies examined burnout among nurses in several provinces in Indonesia.[42 43] The COVID-19 pandemic has, however, placed a spotlight on the specific issues of mental health, trauma, violence or abuse against HCPs by patients or relatives of patients.[28 44–46] Findings on poor treatment in the workplace also align with global reports where healthcare workers experienced stigmatisation and discrimination.[47] Other studies have reported links between symptoms of depression and burnout with increased contact with COVID-19 patients or involvement in the COVID-19 response.[18 19] In addition, conflict of balancing work and family, emotional demands (eg, aggressive or troublesome patients) and job demands (eg, lack of preparedness in role) were also associated with burnout.[48] Our findings regarding concerns of personal well-being and delivery of healthcare during the pandemic have been reflected among wider HCP populations in Indonesia. Reports that looked at HCPs working in COVID-19 response also found that these HCPs experienced increased demands, high patient loads, long working hours and limited PPE.[49] HCPs also reported experiencing stigma and discrimination from the communities, some resulting in deprivation of essential services, social alienation, even physical assault.[50] This study did not report on physical assault, however patient anger at longer wait times was a commonly reported problem among HCP in our sample. In the Philippines, HCPs were required to stay in facilities to prevent risk of COVID-19 transmission to their family, while enduring more frequent and longer hours

Table 4 Factors associated with self-reported trauma or burnout among healthcare providers in Central Java and West Nusa Tenggara, March–April 2022

	N (%)	OR (95% CI)	P value	aOR (95% CI)	P value
Gender of HCP					
Male	93 (15.4)	Reference			
Female	511 (84.6)	1.03 (0.65 to 1.63)	0.89		
Age (years)*					
18 to <30	114 (18.9)	Reference		Reference	
30 to <40	295 (48.8)	1.52 (0.97 to 2.36)	0.07	1.73 (1.06 to 2.83)	**0.03**
40 to <50	132 (21.9)	1.56 (0.93 to 2.62)	0.09	1.73 (0.98 to 3.05)	0.06
50 and older	63 (10.4)	1.01 (0.54 to 1.87)	0.99	1.47 (0.74 to 2.89)	0.27
Current role					
Doctor	40 (6.6)	Reference			
Nurse	186 (30.8)	1.23 (0.60 to 2.50)	0.57		
Midwife	243 (40.2)	0.89 (0.45 to 1.77)	0.74		
Village midwife	135 (22.4)	1.28 (0.62 to 2.68)	0.51		
Years in role					
Between 2 and <5	88 (14.6)	Reference			
<2	35 (5.8)	0.90 (0.40 to 2.01)	0.80		
5 or more years	481 (79.6)	1.10 (0.69 to 1.76)	0.70		
Involvement in RI or COVID-19 immunisation*†					
Neither RI or COVID-19 immunisation	39 (6.5)	Reference		Reference	
Just RI	95 (15.7)	1.68 (0.79 to 3.55)	0.18	2.14 (0.94 to 4.90)	0.07
Just COVID-19 immunisation	181 (29.9)	2.13 (1.06 to 4.29)	**0.03**	2.54 (1.08 to 5.94)	**0.03**
Both RI and COVID-19 immunisation	289 (47.9)	2.46 (1.25 to 4.83)	**0.009**	2.42 (1.06 to 5.52)	**0.03**
Self-efficacy*					
Moderate	198 (32.8)	Reference		Reference	
High	406 (67.2)	0.71 (0.50 to 1.02)	0.07	0.83 (0.56 to 1.23)	0.35
Perception of increased risk of exposure to COVID-19 in workplace*					
No	39 (6.5)	Reference		Reference	
Yes	565 (93.5)	2.20 (1.14 to 4.22)	**0.02**	1.76 (0.88 to 3.52)	0.11
Treated poorly in workplace during COVID-19 pandemic*					
No/Not sure	391 (64.7)	Reference		Reference	
Yes	213 (35.3)	2.62 (1.79 to 3.82)	<0.001	2.26 (1.51 to 3.38)	**<0.001**
Stockouts of COVID-19 vaccines (n=592)*‡					
No/Not sure	378 (63.9)	Reference		Reference	
Yes	214 (36.1)	1.69 (1.18 to 2.42)	**0.01**	1.29 (0.86 to 1.92)	0.21
Heard worrying information about COVID-19 vaccine					
No	379 (62.7)	Reference			
Yes	225 (37.3)	1.13 (0.80 to 1.59)	0.50		
Confidence to respond to patient questions about COVID-19 vaccine*					
Very confident	382 (63.3)	Reference		Reference	
Not at all/A little confident/Moderately	222 (36.7)	1.36 (0.96 to 1.93)	0.09	1.51 (1.03 to 2.22)	**0.04**
Concerned about getting COVID-19					
Not at all/A little/Moderately concerned	373 (61.8)	Reference			
Very concerned	231 (38.2)	1.00 (0.71 to 1.41)	0.99		
Delivering COVID-19 vaccines has taken away from other priorities*					
Did not deliver COVID-19 vaccine	72 (11.9)	Reference		Reference	

Continued

Table 4 Continued

	N (%)	OR (95% CI)	P value	aOR (95% CI)	P value
Not at all/Slightly	407 (67.4)	1.29 (0.78 to 2.13)	0.33	0.79 (0.39 to 1.59)	0.51
Moderately/Very	125 (20.7)	2.65 (1.42 to 4.94)	**0.01**	1.27 (0.56 to 2.91)	0.57
Number of service disruptions experienced*					
3 or less	299 (49.5)	Reference		Reference	
4 or more	305 (50.5)	1.52 (1.09 to 2.13)	**0.01**	1.20 (0.82 to 1.75)	0.34
Number of vaccination strategies to overcome disruptions experienced*					
3 or less	309 (51.2)	Reference		Reference	
4 or more	295 (48.8)	1.59 (1.14 to 2.22)	**0.01**	1.29 (0.87 to 1.89)	0.18

*Variable included in multivariable analysis due to bivariate results or known association to outcome.
†This variable only looks at routine immunisation and COVID-19 immunisation. Participants may have also been involved in other maternal and child health services (table 1).
‡This variable excludes participants whose place of work did not stock COVID-19 vaccines (n=12).
HCP, healthcare provider; RI, routine immunisation.

of working, increasing demand, medical supply shortages and harassment, bullying and abuse.[51] In Nepal, HCPs reported lack of PPE and experiences of stigma lead to increased burnout, fatigue and psychological distress.[52] In Jordan, 65.5% of HCPs in a public hospital reported exposure to workplace verbal and physical violence during the pandemic.[45]

The association between trauma and burnout with delivery of COVID-19 immunisation and the ability to respond to patient queries might also relate to the demand on the health workforce to rapidly gain and implement new concepts related to COVID-19 vaccines and vaccination processes; this highlights the public's reliance on health workers for trusted information. Prior work by some of the study team members found that HCP recommendation is a strong motivator for getting a vaccination.[53 54] Interestingly, in our study, 47.5% HCPs reported not having received formal training in COVID-19 immunisation. These findings highlight the need for mechanisms and innovative ways to ensure the availability of timely, tailored and targeted training and upskilling for the health workforce during acute emergencies.

The pandemic also negatively impacted the mental health of HCPs globally. A 2021 systematic review found pooled prevalence of anxiety and depression resulting from the COVID-19 pandemic to be 37% and 36%, respectively.[14] Other Southeast Asian countries had similar experiences; in Vietnam, 18%, 11.5% and 7.7% of participants reported symptoms of depression, anxiety and stress, respectively.[55] Interestingly, despite a large proportion of HCPs experiencing trauma and burnout from the pandemic in this study, only 23.5% HCPs reported worsened mental and emotional health. It is possible that HCPs may be more willing or perceive it to be more socially acceptable to report physical reasons for trauma or burnout (eg, 'long work hours') rather than to report a decline in emotional or mental health. Disclosure of mental health conditions in the workplace is often difficult due to barriers and perceived risk such as discrimination.[56] Prior studies exploring the negative impact of the COVID-19 pandemic on the mental health of HCPs in Indonesia found clinical factors (eg, lack of PPE), personal (eg, fear of transmitting COVID-19) and social factors (eg, stigma) related to HCPs' psychological well-being.[15 17 18] These findings highlight the need for HCPs to be better supported in the health system, particularly during emergency settings when the burden is inevitably higher. Previous studies in Indonesia used support systems to strengthen the resilience of HCPs, provision of psychological support (eg, therapy), the encouragement to access these services and incentives and compensation for working in a high-risk setting.[16–18] In some low-resource settings, such as Sierra Leone, Liberia, India, Bangladesh and the Democratic Republic of Congo, telephone hotlines, care coordination teams and use of psychological support applications were also used to support HCPs' mental well-being during the COVID-19 pandemic.[57 58] This additional support to the workforce, as well as other modifications to factors such as management of waiting processes at the clinic, may also help to improve patient experience. The pandemic has also highlighted the need to re-imagine the incorporation of health workforce planning as a crucial component of the health system. A recent Organisation for Economic Co-operation and Development report found that the health workforce in many countries is understaffed, under pressure and undervalued.[59] Health workforce shortages existed even prior to the pandemic and were only magnified through the pandemic. Health workers also played a crucial role in absorbing the shocks of the pandemic and risking their own and family's health and well-being. However, the future requires revived momentum that focuses on sustainable and resilient capacity to ensure sufficient numbers, and proper mix and distribution of health workers to respond to population needs. The WHO Roadmap for the public health workforce highlights the need to train a workforce

that can perform essential public health functions, with a focus on developing national workforce strategies that can cater to routine services, health functions and provide surge capacity during an acute emergency.[60–62] These approaches can also be expanded to include immunisation and MCH specialist skills.

Future research is needed that further explores the reasons for trauma and burnout among HCPs in Indonesia, including the relationship with ability to respond to patient questions related to COVID-19 immunisation, and reasons for discordance between HCP reports of trauma and burnout and mental and emotional health. Our study had multiple strengths including the use of validated and field-tested survey tools[31 32] and relatively large sample sizes within the selected provinces. Furthermore, to our knowledge, this is the only paper to explore perspectives and experiences of HCPs working at the provincial level during the pandemic in Indonesia. The study also had some limitations. Our study provides measurement of associations between HCP-reported influences on self-reported trauma or burnout at a single point in time, therefore trends could not be monitored. As the study was only conducted in two provinces, and given Indonesia's decentralised health system, study results cannot be generalised. Our HCP survey sampling frame did not draw from the overall population of HCP in each study location, but rather focused on those working in immunisation and MCH services. As a result, we could not apply population weights to adjust for the survey design. Due to questionnaire design and the structure of co-delivery of immunisation and other MCH services in Indonesia, analysis was not stratified by type of service. Lastly, we used a single questionnaire item to capture data on HCP experiences and perspectives which was not designed to measure trauma or burnout. Our analysis was exploratory, results should be interpreted with caution. Future studies would benefit from the use of a validated scale of trauma or burnout and prospectively collected data to confirm our findings.[16 17 19] Insights from our study can help contribute towards policies to improve HCP experiences during an emergency.

CONCLUSION

Our study reported on experiences and perspectives of the HCP on the disruption to immunisation and MCH services, which are critical components of the primary healthcare system. We found HCPs experienced service disruption, trauma and burnout. However, we also identified local solutions aimed at minimising disruption to service delivery and improving patient experiences, particularly in immunisation and MCH. We highlight the need to ensure that workforce resilience is placed at the centre of the health system and is considered as an integral part of pandemic planning, preparedness and management to ensure continuity of essential health services.

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