# The impact of COVID-19 lockdown on abortion care: a time series analysis of data from Marie Stopes Nepal

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**Abstract:** *The COVID-19 pandemic significantly impacted sexual and reproductive health and rights. Nepal implemented a nationwide lockdown in March 2020, limiting population movement and service access. The 36 clinics run by Marie Stopes Nepal (MSN) closed for varying periods at the beginning of lockdown. This study assesses the impact of lockdown and associated clinic closures on abortion services within MSN's network. An interrupted time-series analysis of clinic-level MSN data compared abortion service use in the pre-closure and post-reopening periods, focusing on the following outcomes: number of abortion care visits, proportion of abortion-related visits, gestational age at time of abortion care and demographics of patients accessing abortion care. Subsequent meta-analyses combined clinic-level results to generate outcome-specific pooled effect estimates. As MSN clinics reopened, during ongoing wider lockdown, weekly visits for abortion care decreased by 37% on average, but abortion increased as a proportion of services post-reopening (OR: 1.53) compared with pre-closure, with no evidence of a change in the proportion of higher gestation abortions. The demographic profile of abortion care clients was altered, with post-reopening clients more likely to have completed primary education (OR: 1.54) and be aged 25 years or older (OR: 1.31) compared with pre-closure clients. COVID-19 lockdown and associated clinic closures reduced the absolute number of abortion services provided within MSN's network, impacting the composition of service provision. Reductions in safe abortion and wider SRH access will have wide-ranging consequences, curtailing crucial reproductive rights. Policy-makers must ensure ongoing abortion access to protect rights and ensure access.* DOI: 10.1080/26410397.2022.2079185

**Keywords:** abortion, COVID-19, sexual and reproductive health and rights

## Background

The scale of the COVID-19 pandemic has required rapid and large-scale public health interventions to mitigate mass mortality and morbidity. Central to these have been restrictions on services and population movement, known as lockdowns, which have included stay-at-home orders, closure of non-essential services and severe disruption to travel networks. While lockdowns have been successful in reducing COVID-19 transmission, an emerging body of evidence is demonstrating the collateral impact of the pandemic and associated restrictions on other areas of health care. Sexual and reproductive (SRH) health care may be particularly susceptible to lockdown and service restrictions, as the provision of family planning and other services may not always be considered essential by governments, which can impact reproductive rights at an individual, as well as wider societal, level. Abortion care, which requires timely access, remains politicised in many

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settings, further complicating decisions on service provision during a crisis. However, abortion care is crucial to reproductive autonomy and therefore the upholding of reproductive justice within society.

The impact of COVID-19 on abortion care has been assessed in a small number of countries. These studies have demonstrated significant changes in access, with reductions in visits to abortion clinics,[1,2] and an increase in the use of self-managed, telemedicine abortion services, where available, during the pandemic.[3,4] MSI Reproductive Choices (MSI), an international provider of SRH care, reported a global fall of 1.9 million clients vs forecast between January and June 2020, from both family planning and abortion client visits.[5] Demand may also be impacted by changes in sexual behaviour or pregnancy desires.[6–8] However, reports are also documenting the range of service adaptations and policy shifts which have been implemented during the pandemic globally to support reproductive rights, including increases in gestational age limits for home medical abortion, approval of medical abortion at home via full telemedicine, or removal of requirements for ultrasound or blood tests.[9,10]

Empirical evidence of the impact of COVID-19 on abortion access in low-resource settings remains scarce. A study of primary health facilities in Nigeria found that several lockdown-associated difficulties, including stock-out of contraceptives, transportation difficulties and lack of personal protective equipment (PPE), led to a reduction in patients accessing wider SRH services.[11] Further, health care organisations in low-resource settings reported severely disrupted transport networks, service closures, restrictions on mobile outreach services and disruptions to supply chains, among other effects.[12–14] Staff shortages, due to redeployment, illness or lack of PPE,[15] were found to be factors further limiting service provision. There were also reports of changes in health-seeking behaviour, driven by factors such as fear of transmission. These factors demonstrate the potential individual and wider systems impact of COVID-19 on sexual and reproductive health and rights (SRHR).

Sexual and reproductive health care implementer reports suggest that South Asia has been one of the global regions most severely impacted by COVID-19 movement restrictions.[5,16] In Nepal, a first nationwide lockdown was imposed on 24 March 2020, followed by a phased exit from lockdown beginning on 14 June 2020.[17] Reports indicated that the demands of the pandemic necessitated a diversion of resources, setting up hospitals specifically to provide emergency, COVID-19-specific care.[18] Further, the majority of private health clinics were required to halt other provision, which impacted the delivery of healthcare services such as child and maternal health care.[18] The Ministry of Health and Population in Nepal surveyed health facilities to assess the functionality and utilisation of essential reproductive, maternal, neonatal, child and adolescent health during the COVID-19 pandemic and associated lockdowns.[19] They found a decrease in both medical and surgical abortion client access in the five months of lockdown, compared with the previous year, although this varied significantly by health facility.

There are specific populations within Nepal that are already at risk of having their reproductive rights restricted, and these intersecting vulnerabilities must be considered. Up to 86% of the population in Nepal live rurally, often in inaccessible mountainous regions where service provision is already limited.[20] Further, 29% of people live in multi-dimensional poverty,[21] and the pandemic-related closures are likely to further limit their access to essential care. Educational attainment is a key social determinant of health, with higher educational status associated with improved health outcomes.[22] The specific gender inequality in educational attainment must be considered. The female adult literacy rate in Nepal is 60%, compared with 79% for adult males.[23] Further, low educational status is closely linked with low socioeconomic status and financial vulnerability,[24] both of which can combine to reduce care access.[25] Importantly, women are at increased financial vulnerability at times of economic uncertainty, owing to their employment predominantly lying within the informal/self-employed economy.[26] This not only impacts on their ability to pay for SRH services, but also may have increased the prevalence of transactional sex, as was seen during the Ebola outbreak in West Africa.[27] Beyond this, women take on the majority of unpaid home care work[26]; as schools have been closed and relatives have become unwell, it is likely that there has been an increased burden to provide care, which may have limited women's ability to leave home to access SRH services. Additionally, with more calls to Intimate Partner Violence (IPV) support lines and stay at home orders limiting alternative living options,

there is evidence that the risk of IPV has increased since the start of the pandemic.[28] Indeed, routine monitoring data indicate a 2.7% increase in IPV during the first COVID wave in Nepal.[29,30] If abortion care and wider SRH services have become more difficult to access, inequalities already present within society may become more stark.[31]

Sexual and reproductive health services, including abortion, are provided through various channels in Nepal, including public/private hospitals, static non-governmental organisation (NGO) clinics (chiefly Marie Stopes Nepal (MSN) and the Family Planning Association of Nepal, or FPAN) and outreach services.[32] Prior to 2002, abortion was illegal with the exception of imminent risk to the woman's life.[33] This had a huge impact, not only on the imprisonment of women (one in five imprisoned women were there for abortion-related crimes), but also on unsafe abortion prevalence and maternal mortality.[34] The Muluki Ain 11th amendment bill, brought in in 2002, was part of a wider women's rights bill, stating that "abortion rights are a part of reproductive rights and essential to realising the right of self-determination".[34] Abortion became legal on request until 12 weeks gestation, and up to 18 weeks if the pregnancy is a result of rape or incest and at any gestation for maternal mental/physical health or fetal health.[35] Beyond legalisation, the bill also mandated that the government make abortion care accessible and affordable.[20] Nepal now has a widespread network of public and private abortion clinics, but services are concentrated in urban areas, with access still limited in rural areas. Further, a significant stigma remains around abortion,[36] particularly amongst unmarried women, which impacts timely and safe access to care. There is also a large unregulated abortion market in Nepal, estimated to be over double the size of the legal sector in 2014, mainly accessed via unregulated pharmacy provision of medical abortion pills.[37,38] These access challenges are likely to have impacted on how services were delivered following the emergence of COVID-19.

In 2020, MSN operated 36 static clinics in 32 districts, alongside mobile outreach services.[39] All 36 of these clinics were forced to close at the point lockdown began (24 March 2020); however, they were able to reopen at different points over the following two months, and 29 of these clinics had reopened prior to the easing of wider societal lockdown restrictions.

This study aims to investigate the impact of Nepal's COVID-19 lockdown and associated clinic closures on abortion provision, through analysis of routine data from MSN, one of the country's largest providers of abortion care. The study outcomes were compared in the pre-closure and post-reopening periods, with clinic closure acting as the "interruption". These clinic closures coincided with the beginning of a wider lockdown, which was ongoing after the reopening of clinics, and so the results should be interpreted in the context of this ongoing societal lockdown.

The specific objectives of this study were:

(1) To compare the total number of clients attending for abortion care at MSN clinics prior to the COVID-19 lockdown and associated clinic closures, and after the reopening of clinics, during wider lockdown.
(2) To assess whether there was a change in the proportion of MSN visits that were for the purpose of abortion care comparing the period prior to the COVID-19 lockdown and associated clinic closures, and after the reopening of clinics, during wider lockdown.
(3) To examine whether there was a change in the profile of clients accessing abortion care at MSN clinics before and after the clinic closures, during wider lockdown, in terms of gestational age at presentation, educational status, and age.

Understanding the impact of the COVID-19 pandemic on SRH access, particularly in a low-resource setting, may provide important information for policy-makers to help mitigate against future adverse collateral events.

## Materials and methods

Routinely collected data from MSN's client information centre, a digital health records system, were analysed. Trends were investigated using interrupted time-series analysis (ITSA), comparing trends pre-closure of clinics, which was prior to lockdown, with trends following reopening of clinics, during wider lockdown, whereby the clinic closure period constituted the interruption. Interrupted time-series analysis was selected as it allows the analysis of an outcome variable over a period of time, with an interruption at a specific time point.[40] Analysis of the pre-interruption outcome variable allows a trend over time to be identified, and comparison of this with the

post-interruption outcome trend allows analysis of the impact of the interruption.

All clinics closed to clients on the first day of national lockdown (24 March 2020), and the date of reopening varied between clinics, ranging from 1 April to 29 May 2020, with a mean closure time of three weeks; a clinic-specific interruption period was derived for analyses. The pre-closure stage comprised the 13-month period from 1 January 2019 to 23 March 2020. This time period was selected to provide an accurate average indicator of service use pre-COVID, with seasonal trends prior to the lockdown period identified and adjusted for in the analysis. Post-reopening data comprised the period between the date of reopening of each clinic and 1 June 2020. The data within this post-reopening phase were collected when MSN clinics were open but the wider national lockdown was ongoing. Two clinics remained closed during the whole post-reopening period of analysis, and five further clinics provided very limited care post-reopening prior to their eventual closure. These seven clinics were therefore excluded from analysis.

Client information centre (CLIC) data were collected from clients at the time of service provision, both to facilitate client care and for reporting purposes. Patient-level data collected included basic sociodemographic factors (age, sex, number of children, occupation and educational attainment), last menstrual period and the type of SRH services sought that day (such as abortion care, contraception, vaccinations or general health counselling). Data were entered electronically by reception clerks following initial clinician data entry on paper forms. A dataset was extracted from CLIC in a fully anonymised format. Individual transaction-level data (i.e. unique service units) were collapsed into visit level data, using unique IDs. For our analysis, abortion care is referring to attendance for a medical or surgical procedure to end a pregnancy. Additionally, post-abortion care is referring to both repeat surgical/medical procedures and counselling/other general follow-up could be provided for treatment undertaken either at an MSN clinic or another abortion provider.

The impact of the COVID-19 lockdown was assessed at an individual clinic level on the following outcomes: total number of abortion client visits per week; percentage of all client visits that were for abortion care, including medical/surgical abortion care and post-abortion care; gestational age of abortions provided, derived from reported data of last menstrual period and categorised as <9 weeks or 9 weeks and over. Additionally, in order to examine whether the socioeconomic profile of clients accessing abortion care changed following the reopening of MSN clinics, both client education level and age were analysed. These were chosen as the most appropriate available socioeconomic indicators as they are ordinal measures, which enabled meaningful ITSA analysis. Further, other socioeconomic variables such as occupation may have recently changed as a result of the pandemic, with education and age representing potentially more stable indicators of socioeconomic status.

Data were initially analysed descriptively, to assess patterns and trends pre-closure and post-reopening. ITSA, using generalised linear modelling, was used to estimate the impact of lockdown on each outcome, with weekly client data used as the unit of analysis and the period of each clinic closure acting as the "interruption" in the time series. Poisson and binomial regression were used to fit the models for count and proportional outcomes, respectively. Models were adjusted for monthly seasonality using a time stratified model, as well as for autocorrelation, as residual autocorrelation remained following seasonality adjustment.

ITSA was conducted in two phases to account for heterogeneous trends in outcomes and seasonality at the clinic level. First, outcomes were analysed at an individual clinic level, as described above. A random-effects meta-analysis was then used to combine the individual regression coefficients to provide national MSN-wide estimates. A forest plot for each outcome was generated, with the size of each clinic box scaled to client load and weighted accordingly based on number of clients. When the meta-analysis demonstrated significant heterogeneity across clinics (significant $I^2$ value), the potential causative impact of clinic characteristics on this difference was examined. All analyses were conducted in Stata v16.

MSI Reproductive Choices has previously obtained ethical approval (approval number 008-16-17A, date of approval 23/10/2019) for routine data used for research purposes, which applies to this research project. In addition to the ethical approval held by MSI Reproductive Choices for such data analysis, ethical approval was sought and provided by the London School of Hygiene & Tropical Medicine prior to the receipt of data or commencement of analysis

(approval number 22167, date of approval 19/06/2020).

## Patient and public involvement

Patients and members of the public were not directly involved in the design of this study.

## Results

Characteristics of abortion provision across the clinics pre-closure and following reopening are summarised in Table 1. From Table 1, there is evidence of a meaningful reduction in the mean number of both weekly client visits, and specifically weekly abortion care visits per clinic once clinics reopened ($p < 0.01$ for both estimates). However, when looking at the service breakdown, the proportion of abortion care visits as a percentage of all visits is significantly higher post-reopening ($p < 0.01$). Additional services accessed at MSN clinics, grouped as "other" in Table 1, include immunisation, screening, gynaecology services and antenatal/postnatal care, and there was evidence of a significant reduction in the proportion of visits for these services post-reopening ($p = 0.03$). There is evidence of a change in the sociodemographic status of clients during lockdown. First, there is a significant reduction in the number of clients attending with no formal education, and a significant increase in the number of clients with tertiary or higher education ($p < 0.01$ for both estimates). There is also a significant reduction in the number of clients under the age of 20, with an increase in the number of clients attending aged between 25 and 44. Further, there is a significant reduction in the number of clients reporting certain occupations (including agriculture, skilled & unskilled manual, student, and sales & services). There is a corresponding significant increase in those accessing care being unemployed or looking for work.

Prior to conducting the final ITSA analysis, a sensitivity analysis was performed to assess whether the difference in length of pre-closure and post-reopening time periods would introduce any bias into the analysis. An initial analysis was run using the exact same 3 months of data in 2019 and 2020 (to allow for seasonality), which demonstrated a very similar trend to the analysis below. The full amount of available data therefore provide a more accurate average indicator of service use pre-COVID, since this analysis also accounts for seasonality and collinearity.

## Total number of clients accessing abortion care

Figure 1 shows the effect estimates of the impact of lockdown on weekly client visit numbers for abortion care by clinic and overall, with a pooled incidence ratio of 0.63 post-clinic reopening, compared with pre-closure (95% CI 0.56–0.71, $p <0.001$). This demonstrates a significantly reduced absolute number of clients attending for abortion care post-reopening. There is evidence of significant heterogeneity between different clinics ($I^2 = 34.0\%$, $p = 0.04$), which was not explained by the urban/rural location of clinics, the average client numbers, or the length of lockdown.

### Proportion of clients receiving abortion care

Figure 2 shows the effect estimates for the impact of lockdown on the proportion of clients receiving abortion care. This demonstrates that a significantly increased proportion of clients attending clinics were doing so to access abortion care following reopening of clinics during lockdown, compared to proportions prior to closure (pooled OR 1.53, 95% CI 1.34–1.74, $p <0.001$). Although there was little statistical evidence of heterogeneity between clinic sites ($I^2 = 9.2\%$, $p = 0.17$), the spread of clinic-specific odds ratios either side of null suggests some differential effects.

### Gestational age

Figure 3 presents the effect estimates for the impact of lockdown on the proportion of abortions occurring at a gestation of <9 weeks. The pooled odds ratio of 0.99 (CI 0.98–1.00), indicates no evidence of a change in the proportion of women attending for early abortions post-reopening during lockdown compared with pre-closure of clinics prior to commencement of lockdown. There was also little evidence of heterogeneity between clinic sites ($I^2 = 12.82\%$, $p = 0.01$).

### Educational status

Figure 4 presents the effect estimates for the impact of lockdown on the proportion of clients accessing abortion care with completed primary education and above (compared to no education or some primary education). The pooled odds ratio is 1.54 (CI 1.26–1.88, $p < 0.001$). This demonstrates a significantly increased odds of clients accessing care during lockdown having completed primary or higher education, compared with pre-closure of clinics prior to lockdown. There is no evidence of significant

**Table 1. Total client numbers, service provision characteristics and client characteristics across MSI Reproductive Choices clinics in Nepal, prior to clinic closure and following reopening during lockdown**

| | Pre-closure | Following clinic reopening | Significance test |
|---|---|---|---|
| | Mean (SD) | Mean (SD) | P value[1] |
| Mean client visit numbers per clinic per week | 57.7 (37.3) | 17.8 (13.3) | **<0.01** |
| Mean number of visits for abortion care per clinic per week | 19.7 (11.7) | 8.7 (6.7) | **<0.01** |
| Mean number of working abortion providers per shift | 1.3(0.5) | 1.3 (0.7) | 0.99 |
| **Service breakdown (% of all visits)** | % (*n*) N = 132910 | % (*n*) N = 3851 | |
| Abortion care visit | 34.4 (45682) | 49.8 (1918) | **<0.01** |
| Contraception-only visit[2] | 28.0 (36996) | 18.6 (718) | **<0.01** |
| General health counselling | 12.1 (16017) | 10.0 (370) | 0.14 |
| Other | 25.7 (34215) | 22.0 (845) | **0.03** |
| **Breakdown of abortion care (% of all abortion visits)** | % (*n*) N = 46544 | % (*n*) N = 2013 | |
| Surgical procedure | 53.2 (24746) | 49.1 (989) | 0.08 |
| Medical procedure | 44.5 (20726) | 44.8 (901) | 0.92 |
| Post abortion care (PAC) | 2.3 (1072) | 6.1 (123) | |
| - Repeat surgical procedure | 0 | 0 | 1 |
| - Repeat medical procedure | 0.5 (212) | 1.4 (28) | 0.68 |
| - Other PAC follow up | 1.8 (860) | 4.7 (95) | 0.19 |
| **Gestation at presentation for abortion care (% of all abortions)** | % (*n*) N = 45682 | % (*n*) N = 1918 | |
| Under 9 weeks | 94.7 (43271) | 92.1 (1767) | 0.27 |
| 9+ weeks | 5.3 (2411) | 7.9 (151) | 0.27 |
| **Client level of education** | % (*n*) N = 132910 | % (*n*) N = 3851 | |
| None/non-formal | 24.4 (32427) | 19.5 (750) | **<0.01** |
| Some primary | 23.9 (31716) | 22.5 (866) | 0.39 |
| Completed primary | 15.2 (20203) | 13.9 (534) | 0.41 |
| Some secondary/vocational/technical | 14.4 (19106) | 15.8 (608) | 0.39 |
| Completed secondary/vocational/technical | 10.7 (14211) | 11.2 (432) | 0.75 |
| Tertiary/higher | 11.4 (15158) | 17.2 (661) | **<0.01** |

| Missing | 0.07 (89) | 0 (0) | |
| --- | --- | --- | --- |
| **Age group** | **% (*n*) *N* = 132910** | **% (*n*) *N* =3851** | |
| <20 years | 4.7 (6234) | 3.6 (138) | **<0.01** |
| 20-24 years | 21 (27884) | 20.1 (775) | 0.19 |
| 25-29 years | 31.2 (41415) | 28.8 (1111) | **<0.01** |
| 30-34 years | 23.3 (30947) | 23.7 (913) | 0.55 |
| 35-39 years | 13.5 (17929) | 16 (620) | **<0.01** |
| 40-44 years | 4.9 (6447) | 6.0 (230) | **<0.01** |
| 45-49 years | 1.3 (1703) | 1.5 (56) | 0.31 |
| Missing | 0.3 (351) | 0.2 (8) | |
| **Client occupation** | **% (*n*) *N* = 132910** | **% (*n*) *N* = 3851** | |
| Agriculture | 25.1 (33322) | 22.0 (847) | **<0.01** |
| Clerical | 0.7 (917) | 1.0 (39) | 0.03 |
| Professional/technical/management | 1.1 (1494) | 1.2 (47) | 0.48 |
| Sales and services | 7.1 (9487) | 6.3 (244) | **0.05** |
| Skilled manual | 4.2 (5633) | 3.6 (138) | **0.04** |
| Student | 6.1 (8069) | 4.3 (165) | **<0.01** |
| Unemployed, not looking for work | 53.0 (70313) | 60.0 (2307) | **<0.01** |
| Unskilled manual | 2.7 (3573) | 1.6 (62) | **<0.01** |
| Missing | 0.0 (102) | 0.0 (2) | |

[1] T test used for comparison of means, z test used for comparison of proportions
[2] Visit in which contraception was the only service provided

heterogeneity between clinics ($I^2 = 21.17\%$, $p = 0.15$), however, the spread of clinic-specific odds ratios either side of null suggests some differential effects. These differential effects are not explained by the urban/rural location of clinics, the average client numbers, or the length of lockdown.

### Age

Figure 5 presents the effect estimates for the impact of lockdown on the proportion of abortion care clients being 25 years of age or older. The pooled odds ratio is 1.31 (CI 1.10–1.56, $p < 0.001$). This demonstrates a significantly higher proportion of clients accessing care during lockdown being 25 years or older, compared with pre-closure of clinics prior to lockdown. There is no evidence of significant heterogeneity between clinics ($I^2 = 3.71$, $p = 0.72$). However, the spread of clinic-specific odds ratios either side of null suggests some differential effects. These differential effects are again not explained by the urban/rural location of clinics, the average client numbers, or the length of lockdown.
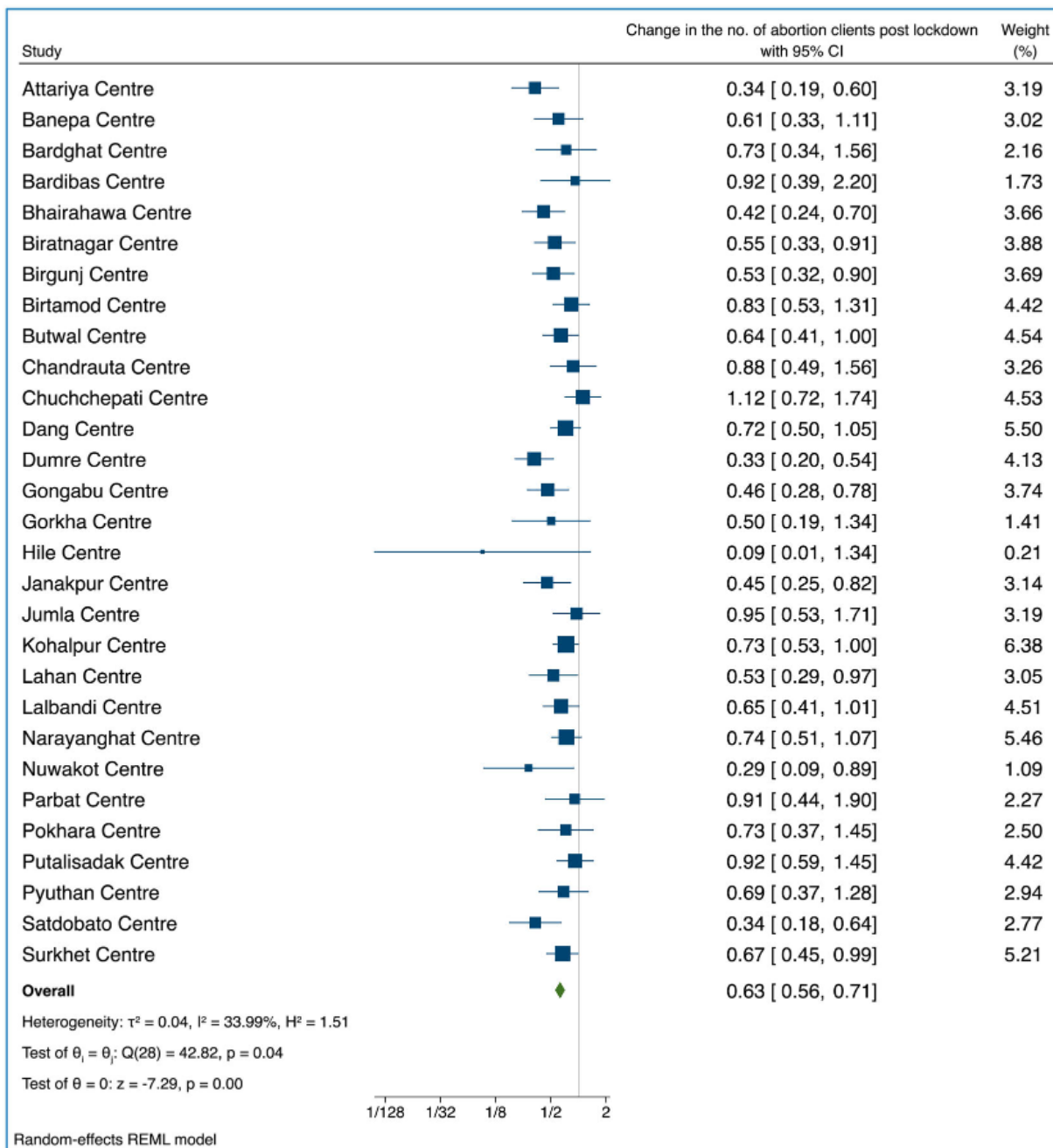
### Discussion

This study examined the impact of COVID-19 lockdown, with the period of clinic closure during

## Figure 1. Individual and pooled incidence ratios of the change in numbers of abortion care clients post-reopening, compared with pre-closure of clinics

| Study | | Change in the no. of abortion clients post lockdown with 95% CI | Weight (%) |
|---|---|---|---|
| Attariya Centre | | 0.34 [ 0.19, 0.60] | 3.19 |
| Banepa Centre | | 0.61 [ 0.33, 1.11] | 3.02 |
| Bardghat Centre | | 0.73 [ 0.34, 1.56] | 2.16 |
| Bardibas Centre | | 0.92 [ 0.39, 2.20] | 1.73 |
| Bhairahawa Centre | | 0.42 [ 0.24, 0.70] | 3.66 |
| Biratnagar Centre | | 0.55 [ 0.33, 0.91] | 3.88 |
| Birgunj Centre | | 0.53 [ 0.32, 0.90] | 3.69 |
| Birtamod Centre | | 0.83 [ 0.53, 1.31] | 4.42 |
| Butwal Centre | | 0.64 [ 0.41, 1.00] | 4.54 |
| Chandrauta Centre | | 0.88 [ 0.49, 1.56] | 3.26 |
| Chuchchepati Centre | | 1.12 [ 0.72, 1.74] | 4.53 |
| Dang Centre | | 0.72 [ 0.50, 1.05] | 5.50 |
| Dumre Centre | | 0.33 [ 0.20, 0.54] | 4.13 |
| Gongabu Centre | | 0.46 [ 0.28, 0.78] | 3.74 |
| Gorkha Centre | | 0.50 [ 0.19, 1.34] | 1.41 |
| Hile Centre | | 0.09 [ 0.01, 1.34] | 0.21 |
| Janakpur Centre | | 0.45 [ 0.25, 0.82] | 3.14 |
| Jumla Centre | | 0.95 [ 0.53, 1.71] | 3.19 |
| Kohalpur Centre | | 0.73 [ 0.53, 1.00] | 6.38 |
| Lahan Centre | | 0.53 [ 0.29, 0.97] | 3.05 |
| Lalbandi Centre | | 0.65 [ 0.41, 1.01] | 4.51 |
| Narayanghat Centre | | 0.74 [ 0.51, 1.07] | 5.46 |
| Nuwakot Centre | | 0.29 [ 0.09, 0.89] | 1.09 |
| Parbat Centre | | 0.91 [ 0.44, 1.90] | 2.27 |
| Pokhara Centre | | 0.73 [ 0.37, 1.45] | 2.50 |
| Putalisadak Centre | | 0.92 [ 0.59, 1.45] | 4.42 |
| Pyuthan Centre | | 0.69 [ 0.37, 1.28] | 2.94 |
| Satdobato Centre | | 0.34 [ 0.18, 0.64] | 2.77 |
| Surkhet Centre | | 0.67 [ 0.45, 0.99] | 5.21 |
| **Overall** | | 0.63 [ 0.56, 0.71] | |

Heterogeneity: $\tau^2 = 0.04$, $I^2 = 33.99\%$, $H^2 = 1.51$

Test of $\theta_i = \theta_j$: Q(28) = 42.82, p = 0.04

Test of $\theta = 0$: z = -7.29, p = 0.00

1/128   1/32   1/8   1/2   2

Random-effects REML model

lockdown acting as an interruption, on access to abortion care provided by a large network of private clinics in Nepal. In the initial post-reopening period analysed, there was no evidence of a change in the gestational age of abortions. However, once clinics had reopened during wider lockdown, the average weekly number of women accessing abortion care at MSN's sites dropped by 37%, compared with pre-lockdown trends. The proportional make up of visits to MSN's SRH services also changed; the odds of attending specifically for abortion care increased by 53%, suggesting an even greater decrease in access to other reproductive health care at MSN, such as contraception. These findings are in keeping

## Figure 2. Individual and pooled odds ratio of visit being related to abortion care post-reopening, compared with pre-closure of clinics
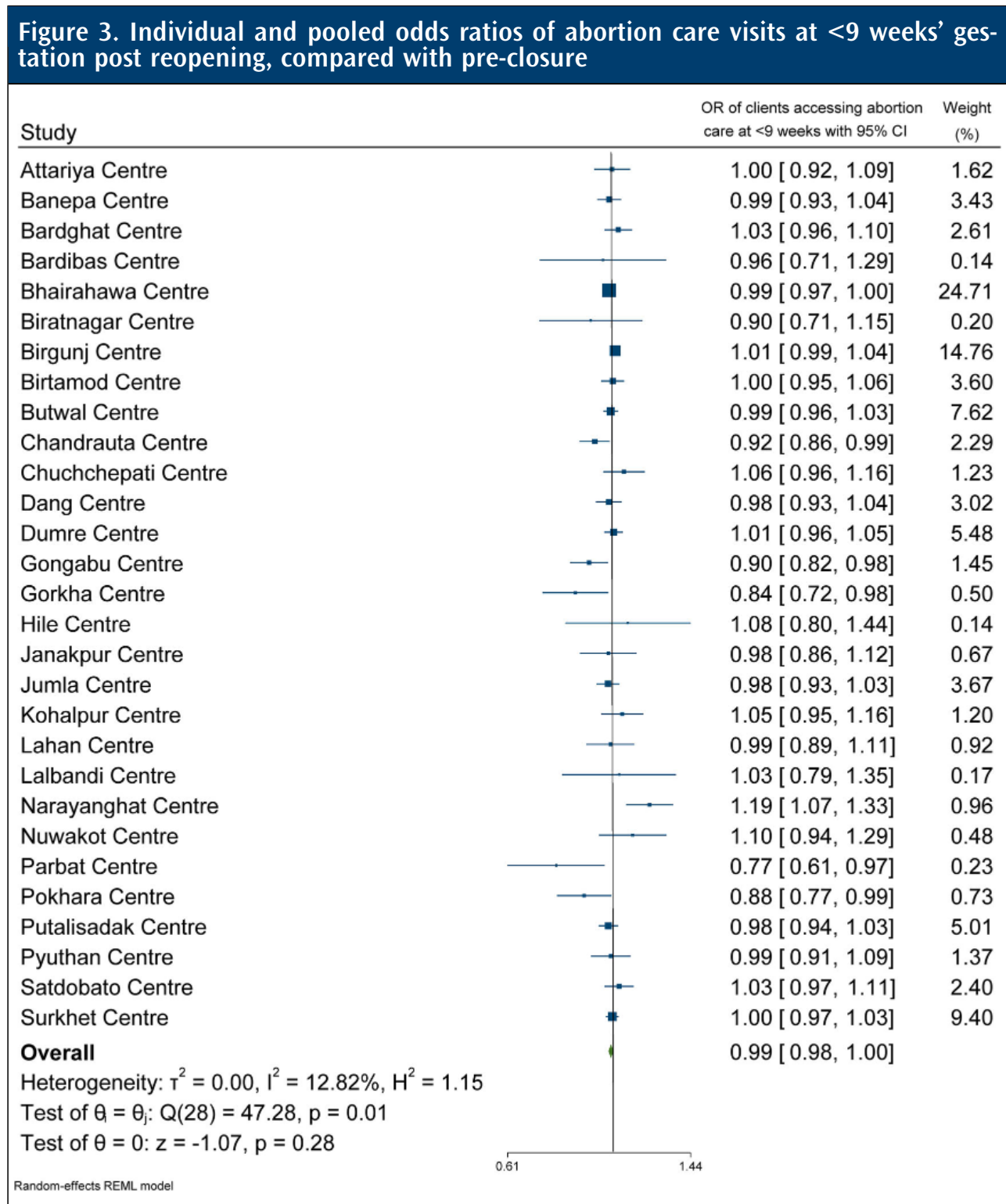
| Study | OR of clients visiting for abortion care with 95% CI | Weight (%) |
|---|---|---|
| Attariya Centre | 0.77 [ 0.37, 1.62] | 2.89 |
| Banepa Centre | 0.88 [ 0.41, 1.92] | 2.64 |
| Bardghat Centre | 0.73 [ 0.31, 1.75] | 2.15 |
| Bardibas Centre | 2.61 [ 0.78, 8.79] | 1.13 |
| Bhairahawa Centre | 2.39 [ 1.20, 4.76] | 3.30 |
| Biratnagar Centre | 1.75 [ 1.01, 3.02] | 4.98 |
| Birgunj Centre | 1.80 [ 1.06, 3.06] | 5.23 |
| Birtamod Centre | 1.26 [ 0.76, 2.09] | 5.68 |
| Butwal Centre | 2.51 [ 1.47, 4.31] | 5.12 |
| Chandrauta Centre | 1.70 [ 0.91, 3.18] | 3.96 |
| Chuchchepati Centre | 3.31 [ 1.81, 6.05] | 4.20 |
| Dang Centre | 1.39 [ 0.88, 2.21] | 6.64 |
| Dumre Centre | 1.51 [ 0.69, 3.31] | 2.59 |
| Gongabu Centre | 2.14 [ 1.06, 4.32] | 3.21 |
| Gorkha Centre | 0.65 [ 0.26, 1.63] | 1.95 |
| Hile Centre | 0.29 [ 0.01, 6.28] | 0.18 |
| Janakpur Centre | 0.94 [ 0.35, 2.57] | 1.65 |
| Jumla Centre | 2.24 [ 0.77, 6.55] | 1.44 |
| Kohalpur Centre | 1.52 [ 0.98, 2.37] | 7.20 |
| Lahan Centre | 1.38 [ 0.64, 2.97] | 2.72 |
| Lalbandi Centre | 2.08 [ 1.06, 4.08] | 3.44 |
| Narayanghat Centre | 1.76 [ 1.13, 2.75] | 7.13 |
| Nuwakot Centre | 0.42 [ 0.11, 1.59] | 0.96 |
| Parbat Centre | 2.44 [ 0.81, 7.38] | 1.36 |
| Pokhara Centre | 1.33 [ 0.49, 3.63] | 1.64 |
| Putalisadak Centre | 1.30 [ 0.67, 2.50] | 3.62 |
| Pyuthan Centre | 1.21 [ 0.64, 2.28] | 3.84 |
| Satdobato Centre | 1.16 [ 0.50, 2.66] | 2.34 |
| Surkhet Centre | 1.33 [ 0.84, 2.09] | 6.80 |
| **Overall** | 1.53 [ 1.34, 1.74] | |

Heterogeneity: $\tau^2 = 0.01$, $I^2 = 9.20\%$, $H^2 = 1.10$

Test of $\theta_i = \theta_j$: Q(28) = 35.16, p = 0.17

Test of $\theta = 0$: z = 6.31, p = 0.00

1/64    1/8    1    8

Random-effects REML model

with those identified both during previous infectious disease outbreaks and since the emergence of COVID-19[3–5]; namely that SRH care is not accessed in the same quantity and composition during pandemics.

Understanding the mechanisms for reduced service use post-clinic reopening was not within the scope of this study, and it is difficult to differentiate the impact of lockdown itself vs the wider societal impacts of COVID-19. The data analysed and wider literature do provide some hypotheses, however. It is unlikely that the decrease in abortion numbers was caused by changes in supply in MSN clinics themselves, given that there was

## Figure 3. Individual and pooled odds ratios of abortion care visits at <9 weeks' gestation post reopening, compared with pre-closure



| Study | OR of clients accessing abortion care at <9 weeks with 95% CI | Weight (%) |
|---|---|---|
| Attariya Centre | 1.00 [ 0.92, 1.09] | 1.62 |
| Banepa Centre | 0.99 [ 0.93, 1.04] | 3.43 |
| Bardghat Centre | 1.03 [ 0.96, 1.10] | 2.61 |
| Bardibas Centre | 0.96 [ 0.71, 1.29] | 0.14 |
| Bhairahawa Centre | 0.99 [ 0.97, 1.00] | 24.71 |
| Biratnagar Centre | 0.90 [ 0.71, 1.15] | 0.20 |
| Birgunj Centre | 1.01 [ 0.99, 1.04] | 14.76 |
| Birtamod Centre | 1.00 [ 0.95, 1.06] | 3.60 |
| Butwal Centre | 0.99 [ 0.96, 1.03] | 7.62 |
| Chandrauta Centre | 0.92 [ 0.86, 0.99] | 2.29 |
| Chuchchepati Centre | 1.06 [ 0.96, 1.16] | 1.23 |
| Dang Centre | 0.98 [ 0.93, 1.04] | 3.02 |
| Dumre Centre | 1.01 [ 0.96, 1.05] | 5.48 |
| Gongabu Centre | 0.90 [ 0.82, 0.98] | 1.45 |
| Gorkha Centre | 0.84 [ 0.72, 0.98] | 0.50 |
| Hile Centre | 1.08 [ 0.80, 1.44] | 0.14 |
| Janakpur Centre | 0.98 [ 0.86, 1.12] | 0.67 |
| Jumla Centre | 0.98 [ 0.93, 1.03] | 3.67 |
| Kohalpur Centre | 1.05 [ 0.95, 1.16] | 1.20 |
| Lahan Centre | 0.99 [ 0.89, 1.11] | 0.92 |
| Lalbandi Centre | 1.03 [ 0.79, 1.35] | 0.17 |
| Narayanghat Centre | 1.19 [ 1.07, 1.33] | 0.96 |
| Nuwakot Centre | 1.10 [ 0.94, 1.29] | 0.48 |
| Parbat Centre | 0.77 [ 0.61, 0.97] | 0.23 |
| Pokhara Centre | 0.88 [ 0.77, 0.99] | 0.73 |
| Putalisadak Centre | 0.98 [ 0.94, 1.03] | 5.01 |
| Pyuthan Centre | 0.99 [ 0.91, 1.09] | 1.37 |
| Satdobato Centre | 1.03 [ 0.97, 1.11] | 2.40 |
| Surkhet Centre | 1.00 [ 0.97, 1.03] | 9.40 |
| **Overall** | 0.99 [ 0.98, 1.00] | |

Heterogeneity: $\tau^2 = 0.00$, $I^2 = 12.82\%$, $H^2 = 1.15$

Test of $\theta_i = \theta_j$: Q(28) = 47.28, p = 0.01

Test of $\theta = 0$: z = −1.07, p = 0.28

0.61    1.44

Random-effects REML model

no difference in the mean number of abortion care providers working per shift at clinics pre-closure and post-reopening (Table 1). Changes in demand for abortion must be considered; it is possible that women may have deprioritised abortion access or changed pregnancy intention during the crisis. Evidence of COVID-19 impacts from other settings indicates that women have reduced their pregnancy intentions during the COVID-19 crisis.[41,42] Additionally, global studies
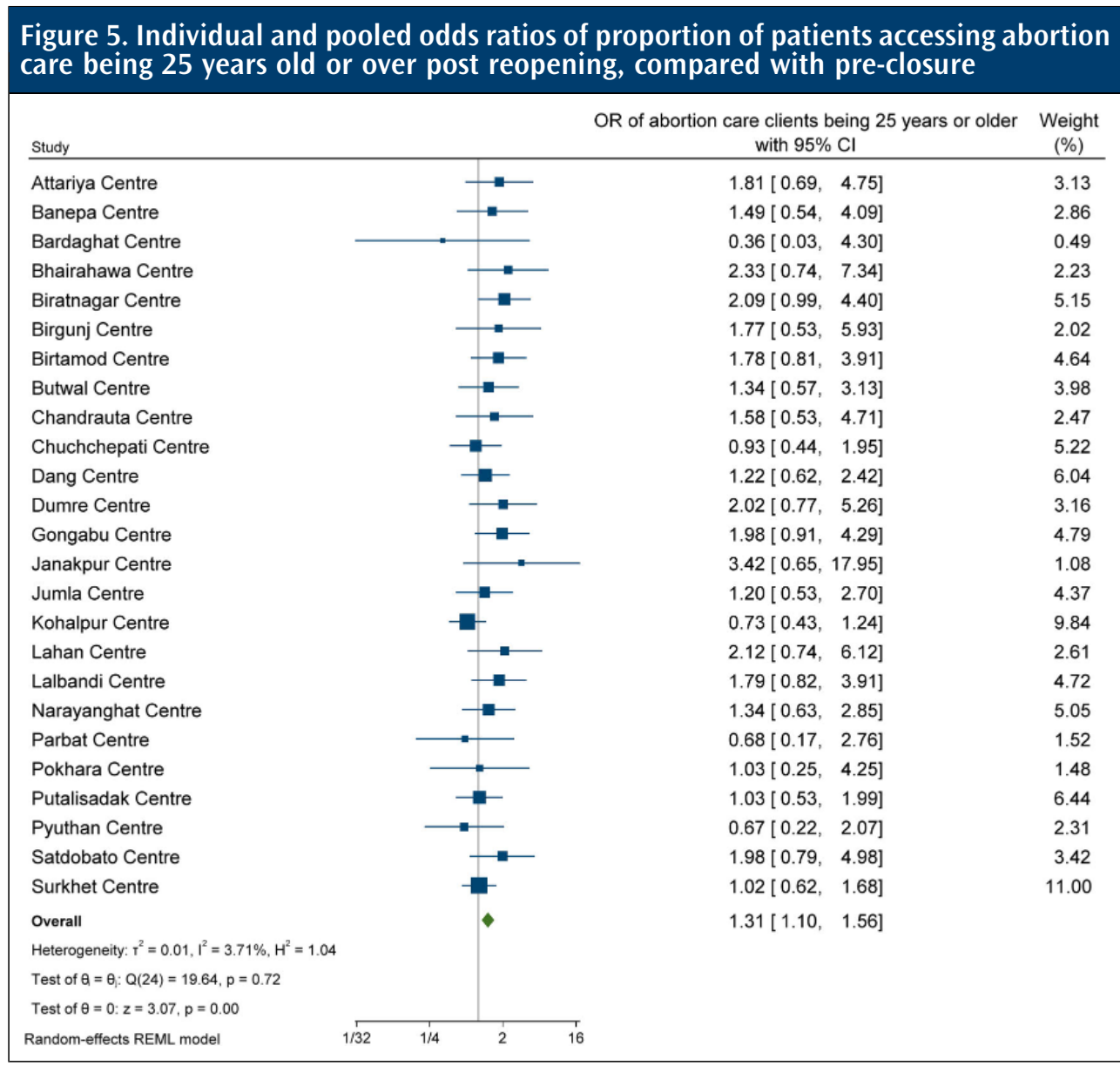
## Figure 4. Individual and pooled odds ratios of proportion of patients accessing abortion care having completed primary education and above post reopening, compared with pre-closure
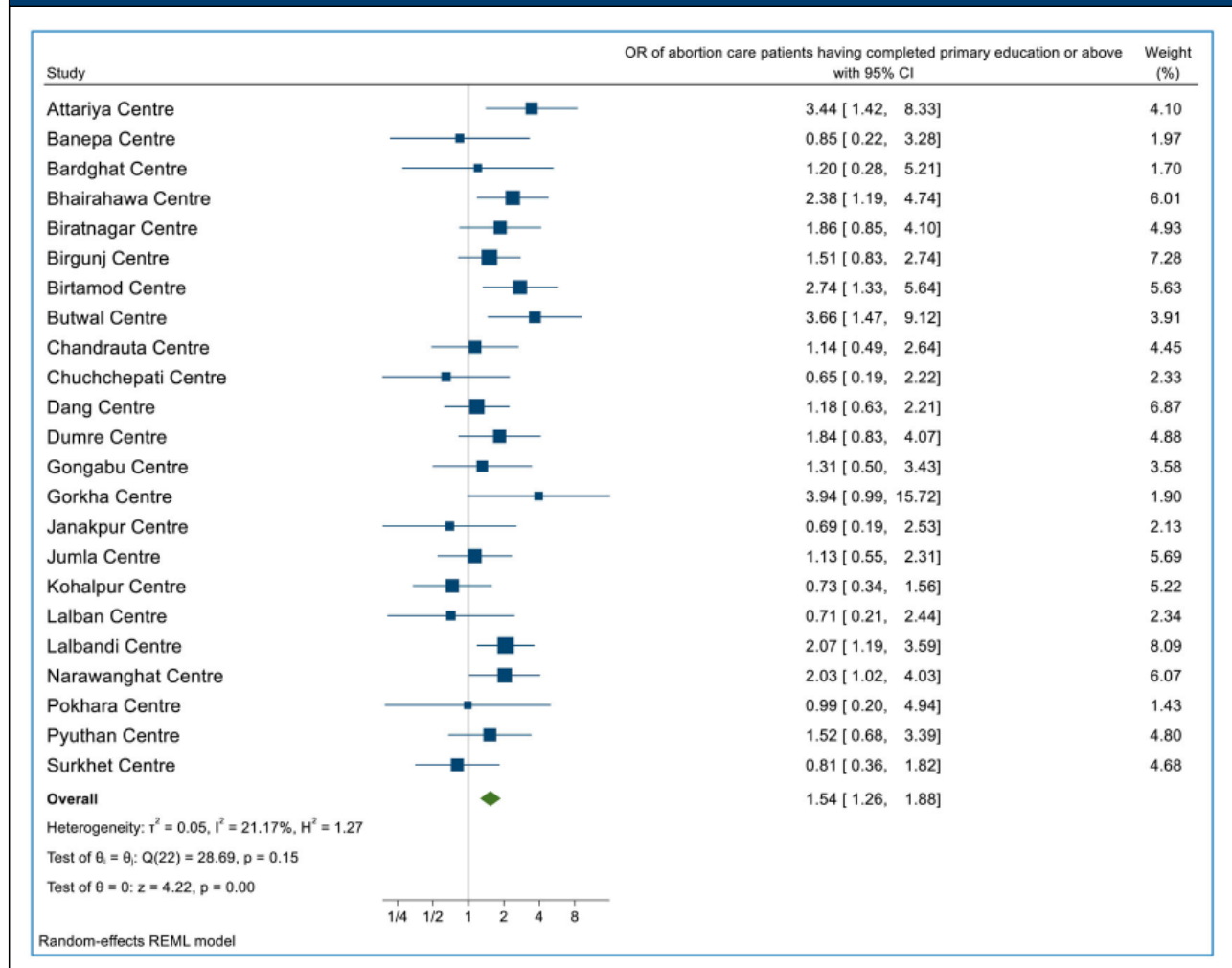


have demonstrated that wider health-seeking behaviour has been impacted, with patients appearing to avoid attending even for essential health care due to fear of contracting COVID-19.[43] However, MSN itself increased its referral rates from calls to its national contact centre for abortion care during April 2020 (compared to prior months), indicating that, in this context, access itself was likely a key contributing factor to the drop in uptake of services.

It is possible that abortions may have been accessed elsewhere beyond the MSN network. However, it is unlikely there was a substantive shift to the public or trained pharmacy sectors within the period of data collection: public services were dealing with the COVID-19 response,

with limited ability to provide other services.[18] Further, a recent study within a tertiary centre in Nepal is in line with our findings; they also found a significant decrease in the number of women accessing safe abortion services, with an indication that barriers in accessibility, such as rural location, were a key factor in this reduction of service use.[44] An interim National Guideline was brought in by the Ministry of Health and Population to facilitate access to at-home early medical abortion services provided by trained providers, but this was only introduced from the 21st of May 2020, and therefore any impacts of this policy change would not have been widely represented within this dataset.[45,46] It is therefore likely that, within this period, women were unable

**Figure 5. Individual and pooled odds ratios of proportion of patients accessing abortion care being 25 years old or over post reopening, compared with pre-closure**



| Study | OR of abortion care clients being 25 years or older with 95% CI | Weight (%) |
|---|---|---|
| Attariya Centre | 1.81 [ 0.69, 4.75] | 3.13 |
| Banepa Centre | 1.49 [ 0.54, 4.09] | 2.86 |
| Bardaghat Centre | 0.36 [ 0.03, 4.30] | 0.49 |
| Bhairahawa Centre | 2.33 [ 0.74, 7.34] | 2.23 |
| Biratnagar Centre | 2.09 [ 0.99, 4.40] | 5.15 |
| Birgunj Centre | 1.77 [ 0.53, 5.93] | 2.02 |
| Birtamod Centre | 1.78 [ 0.81, 3.91] | 4.64 |
| Butwal Centre | 1.34 [ 0.57, 3.13] | 3.98 |
| Chandrauta Centre | 1.58 [ 0.53, 4.71] | 2.47 |
| Chuchchepati Centre | 0.93 [ 0.44, 1.95] | 5.22 |
| Dang Centre | 1.22 [ 0.62, 2.42] | 6.04 |
| Dumre Centre | 2.02 [ 0.77, 5.26] | 3.16 |
| Gongabu Centre | 1.98 [ 0.91, 4.29] | 4.79 |
| Janakpur Centre | 3.42 [ 0.65, 17.95] | 1.08 |
| Jumla Centre | 1.20 [ 0.53, 2.70] | 4.37 |
| Kohalpur Centre | 0.73 [ 0.43, 1.24] | 9.84 |
| Lahan Centre | 2.12 [ 0.74, 6.12] | 2.61 |
| Lalbandi Centre | 1.79 [ 0.82, 3.91] | 4.72 |
| Narayanghat Centre | 1.34 [ 0.63, 2.85] | 5.05 |
| Parbat Centre | 0.68 [ 0.17, 2.76] | 1.52 |
| Pokhara Centre | 1.03 [ 0.25, 4.25] | 1.48 |
| Putalisadak Centre | 1.03 [ 0.53, 1.99] | 6.44 |
| Pyuthan Centre | 0.67 [ 0.22, 2.07] | 2.31 |
| Satdobato Centre | 1.98 [ 0.79, 4.98] | 3.42 |
| Surkhet Centre | 1.02 [ 0.62, 1.68] | 11.00 |
| **Overall** | 1.31 [ 1.10, 1.56] | |

Heterogeneity: $\tau^2 = 0.01$, $I^2 = 3.71\%$, $H^2 = 1.04$

Test of $\theta_i = \theta_j$: Q(24) = 19.64, p = 0.72

Test of $\theta = 0$: z = 3.07, p = 0.00

Random-effects REML model

to access clinics due to restrictions in movement, and were forced to either continue with an unintended pregnancy, or seek medical abortion from outside the formal regulated system, for example through untrained pharmacies. This is supported by evidence collected from MSN's call centre network, who reported challenges for women in leaving the house, and being confronted by officials when trying to move around.[5] Of note, there is also some evidence of an increase in the proportion of clients accessing post-abortion care. Although not statistically significant, this increase in post-abortion care may be reflective of women accessing abortion treatment outside of formal, regulated channels, which then required follow-up management within MSN clinics.

The increased proportion of abortion care observed during lockdown, once clinics reopened, at a time of overall reduced abortion care, is driven by a corresponding reduction in other service delivery at MSN, such as the reduction in contraception-only and other service visits demonstrated in Table 1. The changing pattern of service use may reflect prioritisation by clients of certain types of care. Although a mix of services were available post-clinic reopening, abortion is time-sensitive, whereas other services, such as vaccination, screening or contraception, may be seen

by patients as non-urgent and therefore post-poned. Reduced access to family planning, however, may have caused lagged effects on unplanned pregnancy and subsequent abortion demand in later weeks and months, not captured by this analysis.

While this analysis found no evidence for increase in gestational age among those seeking an abortion during the pandemic, this finding was limited by the relatively short post-clinic reopening analysis timeframe. Further analysis is required to assess any potential lagged effects on this outcome. Selection bias may be an issue in the sample, since data only included women who successfully accessed abortion care at MSN. Given that the provision of second trimester care is almost exclusively provided by public hospitals, due to strict national regulation,[34] our data may not fully represent changes in gestational age during the analysis period.

The increased odds of clients attending for abortion care from higher educational status and older age ranges provide some understanding of how the reproductive rights of marginalised groups may have been impacted by COVID-19 and associated lockdowns. It is, however, unclear what the specific driving force is behind these altered client demographics. A recent synthesis of evidence relating to reproductive justice in the time of COVID-19 found that, although there is mounting evidence that there will be a significant indirect impact of the COVID-19 pandemic on SRH care generally, there is limited understanding of how COVID-19 and related policy measures, such as lockdowns, will specifically impact at-risk groups.[47] Further research on service provision among other marginalised groups, such as adolescents, sex workers and those of low socioeconomic status would be beneficial, as inequalities already present within society may have exacerbated pre-existing differences in access to care. With increased difficulty delivering services in a time of national lockdown, due to factors such as redeployment of staff and difficulty attending clinics for care,[43] vulnerable groups may be left with limited or no safe options to access care, which represents a significant violation of their reproductive rights. Further, the political and stigmatising aspects of abortion provision cannot be overlooked, and gendered inequalities that are already present within society can intersect with the impact of the pandemic and other potential marginalising factors,

such as the caregiving role, low socioeconomic/educational status and adolescent age, to limit access to this essential service.

There are some limitations to this study. First, there were limited post-clinic reopening data available at the time of analysis. The data analysed here may not have demonstrated the full relationships between interruption and outcomes, although our data indicated that impacts were severe immediately following implementation of lockdown. There was also significant heterogeneity between clinic sites for several outcomes; the reason for this heterogeneity requires further investigation but it suggests that the lockdown effects were not the same across the country. Further analysis of the impacts of lockdown on public sector abortion provision, particularly in the second trimester, may help fill gaps in conclusions on the impact of lockdown on national abortion access. Further research could also examine the longer-term impacts of lockdown and other public health control mechanisms on SRH outcomes, particularly as changes in sexual behaviour and/or pregnancy intentions may have a lagged effect on service use patterns.

This study also points to the value of ongoing monitoring of routine data trends during a crisis. The large drop in abortion caseloads during the study timeframe was immediately known to MSN programme managers and these data were critical for advocacy and policy initiatives with local and national government during 2020. Many countries, including Nepal, did not initially classify SRH as "essential" health services at the onset of COVID-19 lockdowns, despite the time sensitivity of abortion provision,[48] and these routine data were used to demonstrate the deleterious impacts of COVID-19 lockdowns on women's health.[5] Nepal's government subsequently brought in measures to facilitate increased access to abortion, with a swift approval of interim national guidelines allowing clients and health workers to have temporary exemptions from COVID-19 travel restrictions, and authorising at-home medical abortion (MA) services. Trained service providers were then able to provide door-to-door delivery of abortion drugs and services, and trained pharmacists could store and distribute MA drugs. This is one example of a new model of delivering accessible SRH care; other countries, such as the UK,[49] also updated their service delivery in a way that was proven to be acceptable, feasible and safe to patients.[50,51] Further,

the World Health Organization has recently released recommendations for at-home medical abortion to support countries more widely to provide accessible abortion care.[52] The exceptional status of the COVID-19 pandemic can therefore be viewed as a window of opportunity to introduce equitable service delivery models that can be maintained into the future.

## Conclusion

This study provides some of the first empirical evidence of the negative impacts of COVID-19 lockdowns on abortion access in a lower-resource setting. The lockdown significantly impacted both the number of abortion care clients and composition of service provision within a network of SRH clinics in Nepal. Our findings indicate that the crisis led to gaps in abortion service provision as well as drops in use of wider SRH services, such as family planning. Despite the WHO declaring SRH care as an essential package of services,[53] the findings suggest that national governments must act earlier to ensure that these time-sensitive services remain available and accessible when infectious disease outbreaks occur. A minimum level of service delivery must always be maintained for urgent outpatient SRH care, and particular consideration must be taken of vulnerable groups to ensure their reproductive rights are protected. Ongoing monitoring of service trends can be used to rapidly identify problems in access and support the evolution of innovative policy responses to ensure access to care. Nepal has been a global innovator in ensuring legal recourse to safe abortion care, both before and during the pandemic, and its actions in supporting access to at-home abortion services with pharmacy-provided medical abortion are a useful example that other countries can follow.

### Disclosure statement

*No potential conflict of interest was reported by the author(s).*

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### Résumé

La pandémie de COVID-19 a eu d'importantes conséquences sur la santé et les droits sexuels et reproductifs. En mars 2020, le Népal a confiné l'ensemble du pays, limitant les déplacements de la population et l'accès aux services. Au début du confinement, les 36 dispensaires gérés par Marie Stopes Nepal (MSN) ont fermé pendant différentes périodes. Cette étude évalue les répercussions du confinement et des fermetures associées des centres sur les services d'avortement dans le cadre du réseau de MSN. Une analyse de série temporelle interrompue portant sur les données de MSN au niveau des établissements de santé a comparé l'utilisation des services d'avortement pendant les périodes précédant la fermeture et suivant la réouverture. Elle s'est centrée sur les résultats suivants: nombre de visites pour soins en cas d'avortement, proportion de visites relatives à un avortement, âge gestationnel au moment des soins pour avortement et caractéristiques démographiques des patientes ayant accès aux soins pour avortement. Des méta-analyses ultérieures ont combiné les résultats au niveau des établissements de santé pour produire des estimations des effets groupés spécifiques aux résultats. Lorsque les dispensaires de MSN ont rouvert, alors que le confinement se poursuivait, les visites hebdomadaires pour des soins en cas d'avortement ont diminué de 37% en moyenne,

### Resumen

La pandemia de COVID-19 tuvo un impacto significativo en la salud y los derechos sexuales y reproductivos. Nepal implementó un cierre nacional en marzo de 2020, que limitó el movimiento de la población y el acceso a servicios. Las 36 clínicas administradas por *Marie Stopes Nepal* (MSN) cerraron durante diversos períodos al inicio del cierre. Este estudio evalúa el impacto que tuvieron el cierre y cierres de clínicas asociados en los servicios de aborto dentro de la red de MSN. Un análisis de series temporales interrumpidas de datos de MSN a nivel de las clínicas comparó el uso de servicios de aborto en los períodos pre-cierre y post-reapertura, centrándose en los siguientes resultados: número de consultas en busca de servicios de aborto, proporción de consultas relacionadas con el aborto, edad gestacional en el momento en que se brindó el servicio de aborto y datos demográficos de las pacientes que accedieron a servicios de aborto. Meta-análisis subsiguientes combinaron los resultados a nivel de clínicas para generar estimaciones de los efectos combinados relacionados específicamente con los resultados. A medida que las clínicas de MSN volvieron a abrir, durante el cierre más amplio en curso, las consultas semanales en busca de servicios de aborto disminuyeron en un 37% en promedio, pero el número de abortos aumentó como proporción de los servicios post-reapertura (OR:

mais l'avortement a augmenté comme proportion des services après la réouverture (RC: 1,53) par comparaison avec la période précédant la fermeture, sans données permettant d'indiquer un changement dans la proportion d'avortements à un âge gestationnel plus élevé. Le profil démographique des clientes des soins pour avortement s'est modifié, les clientes après la réouverture ayant plus de probabilités d'avoir achevé l'enseignement primaire (RC: 1,54) et d'être âgées de 25 ans ou plus (RC: 1,31), par rapport aux clientes d'avant la fermeture. Le confinement dû à la COVID-19 et les fermetures associées des centres ont réduit le nombre absolu de services d'avortement réalisés dans le cadre du réseau de MSN, ce qui a eu des conséquences sur la composition des services assurés. Les réductions des avortement sûrs et de l'accès plus large à la SSR auront des répercussions de grande portée, en restreignant des droits reproductifs essentiels. Les décideurs doivent veiller à maintenir la continuité des soins pour avortement afin de protéger les droits et garantir l'accès.

1.53); comparado con el número pre-cierre, sin evidencia de un cambio en la proporción de abortos a edades gestacionales más avanzadas. El perfil demográfico de las usuarias de servicios de aborto fue alterado: las usuarias post-reapertura tenían más probabilidades de haber concluido sus estudios primarios (OR: 1.54) y de tener 25 años o más (OR: 1.31) comparadas con las usuarias pre-cierre. El cierre por COVID-19 y los cierres de clínicas asociados disminuyeron el número absoluto de servicios de aborto proporcionados dentro de la red de MSN, lo cual afectó la composición de la prestación de servicios. Las reducciones en servicios de aborto seguro y en un acceso más amplio a los servicios de SSR tendrán amplias consecuencias y restringirán derechos reproductivos cruciales. Los formuladores de políticas deben velar por el acceso continuo a los servicios de aborto para proteger los derechos y garantizar el acceso.