Local responses to a global pandemic:
experiences from a collaborative partnership spanning nine countries

7th Global Symposium on Health Systems Research
November 4, 2022

Isabel Fulcher, Harvard Medical School, USA
Alphonse Nshimyiryo, Inshuti Mu Buzima, Rwanda
Zeus Aranda, Compañeros En Salud, Mexico
Marco Tovar, Socios En Salud, Peru
Emilia Connolly, Abwenzi Pa Za Umoyo, Malawi
Bethany Hedt-Gauthier, Harvard Medical School, USA

Introduction & Overview

Isabel Fulcher, PhD
Former Postdoctoral Fellow
Harvard Medical School, USA

Research lightning talks

Capacity building initiatives

Contributor Question & Answer

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Contributor Question & Answer

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The Global Health Delivery Partnership

Division of Global Health Equity
Brigham and Women's Hospital

Partners In Health

Global Health Research Core
Dept of Global Health and Social Medicine
Harvard Medical School

Cross-PIH site collaboration

- ***Facilitate*** the development of high-quality COVID-related research at sites
- ***Reduce*** duplicative work across both sites and clinical areas
- ***Harmonize*** processes in a way that enables cross-site analyses
- ***Promote*** equitable opportunities for participation in research and research dissemination

Jean Claude Mugunga,
Deputy CMO, PIH

Megan Murray,
Professor, HMS
Director of Research, PIH

We implemented a variety of studies

1. Serosurveillance – *what is the burden of COVID-19?*

2. Cohort studies – *how has COVID-19 affected specific populations?*

3. Using routine health systems data for:

    - Syndromic surveillance – *what regional areas may be having higher than expected rates of COVID-19-associated symptoms?*

    - Health service utilization – *did the number of individuals receiving care change during the COVID-19 pandemic?*

Serosurveillance

- **Methods development:** Extending lot quality assurance sampling to account for imperfect tests (Fulcher et al, 2022, BMC Public Health)
- **Protocol guidance:** Should individuals receive the results of their antibody tests? (Mugunga et al., 2021, The Lancet)
- **Serosurveys:** Supporting countries design studies and/or analyze data
  - Antibody tests among health workers in Haiti in April-September 2020
  - Population-based seroprevalence studies in Peru and Mexico

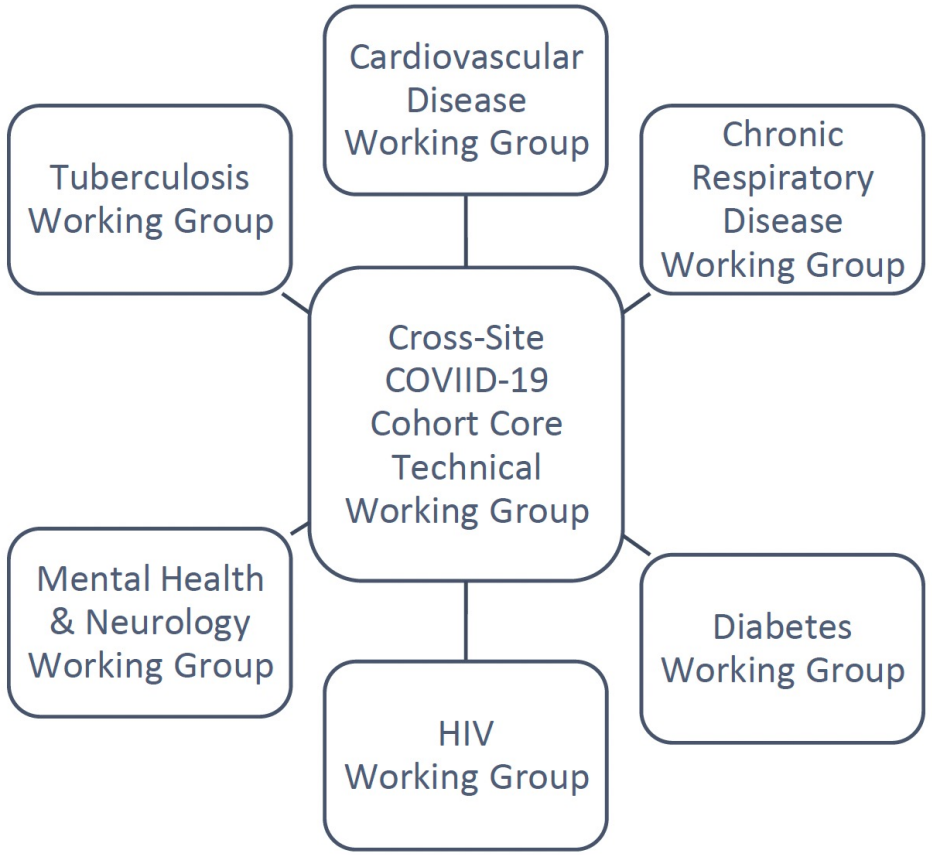
Cohort studies

To understand:

1. Epidemiology and progression of disease, overall and in specific risk-groups.
2. Changes in care and/or outcomes for chronic care patients.

Activities:

- Create overall cohort designs that align with sites' priorities
- Develop data collection tools .
- Facilitate protocol development and ethical approvals, including providing a core protocol template.
- Harmonize data collection and processing procedures.
- Seek funding to support activities centrally and at sites.

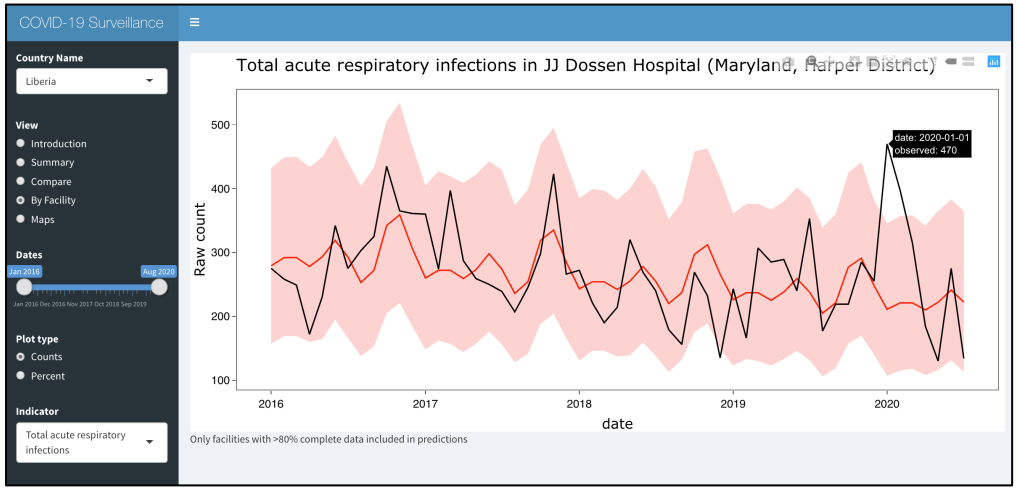


PIH Cross-Site COVID-19 Cohort Research Network:
A central core technical working group coordinated across multiple disease-specific teams

Using routine health systems data

Methods development:
Identifying deviations using monthly time series data

Monthly monitoring



Cross-site research

- Acute respiratory infections in Liberia (Fulcher et al., IJE, 2021)
- Childhood immunizations (Connolly et al., WHO Bulletin, 2021)
- Maternal health service utilization (Aranda et al., BMJ Global Health, 2021)

How did the cross-site collaboration work?

Identifying research questions

- Biweekly working group meetings from April 2020 to June 2022
- Brainstorm potential research activities
- Assess interest across site to assemble a team

Assembling a cross-site team

- Decide on project roles at outset
- Typically, 1-2 lead writers, 1-2 analysts, 1 scientific lead
- Site-specific contributors
- Identify what additional training or support is needed

Ethical approvals & data sharing

- Site-specific IRBs and DUAs
- Non-PIH analysts (at Harvard) approved by each site
- Governance structure documents were key for larger coordination

Gathering resources

- Technical support from graduate students, aligned with thesis goals
- Received 3 grants to fund cross-site efforts, but some work was still unfunded

COVID-19 Multicountry Research Group

PIH/Boston
Nidia Correa
Jean Claude Mugunga
Natalie Price

PIH/Haiti
Peterson Abnis I Faure
Mary Clisbee
Wesler Lambert
Fernet Leandre
Jeune Marc Antionne

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Rebecca Cook
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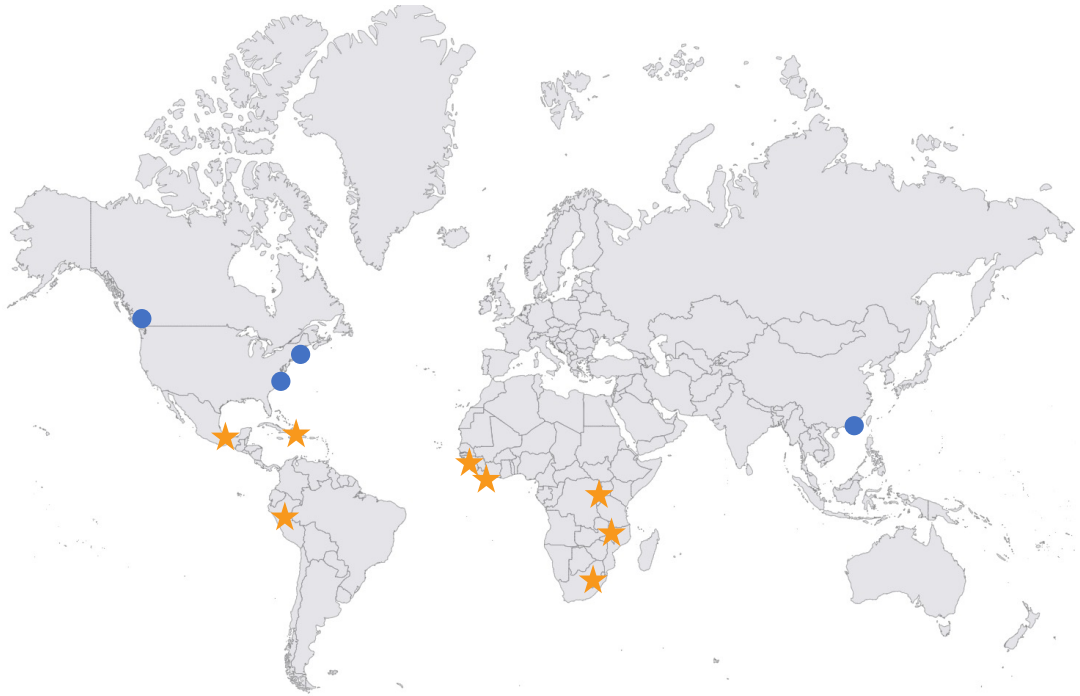

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Thiane Mohlouoa
Meba Msuya
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Alma Adler
Dale Barnhart
Leah Ekbladh
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Bethany Hedt-Gauthier
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Michael Law

University of Hong Kong
Karen Grepin

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- After each research talk, there will be 2 minutes to ask *clarifying* questions
- Submit other questions via **www.menti.com**
- Moderator will collate questions for Q&A
- If question is for specific presenter, please reference their first or last name
- Questions will be public but can remain anonymous

The Impact of COVID-19 on Access to Cancer Care in Rwanda: A Retrospective Time-series Study Using Electronic Medical Records Data

Authors:

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Presenter:

Alphonse Nshimyiryo,
Data Analyst, Department of Research and Training, PIH/IMB

November 4, 2022

Background

- Worldwide, the COVID-19 pandemic disrupted the provision of and access to routine healthcare services.
- Chronic care patients, including cancer patients and people living in resource-limited settings have particularly been vulnerable.
- However, little is known about the impact of COVID-19 on access to cancer care in low- and middle-income countries.
- In this study, we assessed the impact of COVID-19 on access to cancer care in Rwanda.
- We used electronic medical record (EMR) system data collected at the Butaro Cancer Center of Excellence between January 2016 and July 2021.

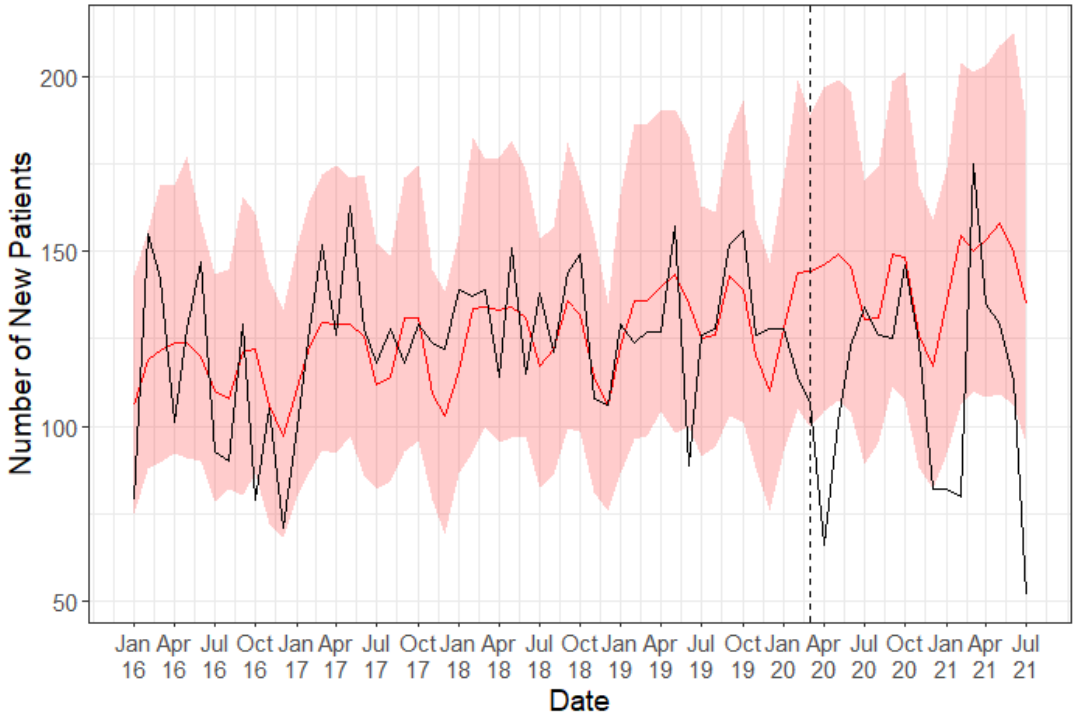
Butaro Cancer Center of Excellence (BCCOE)

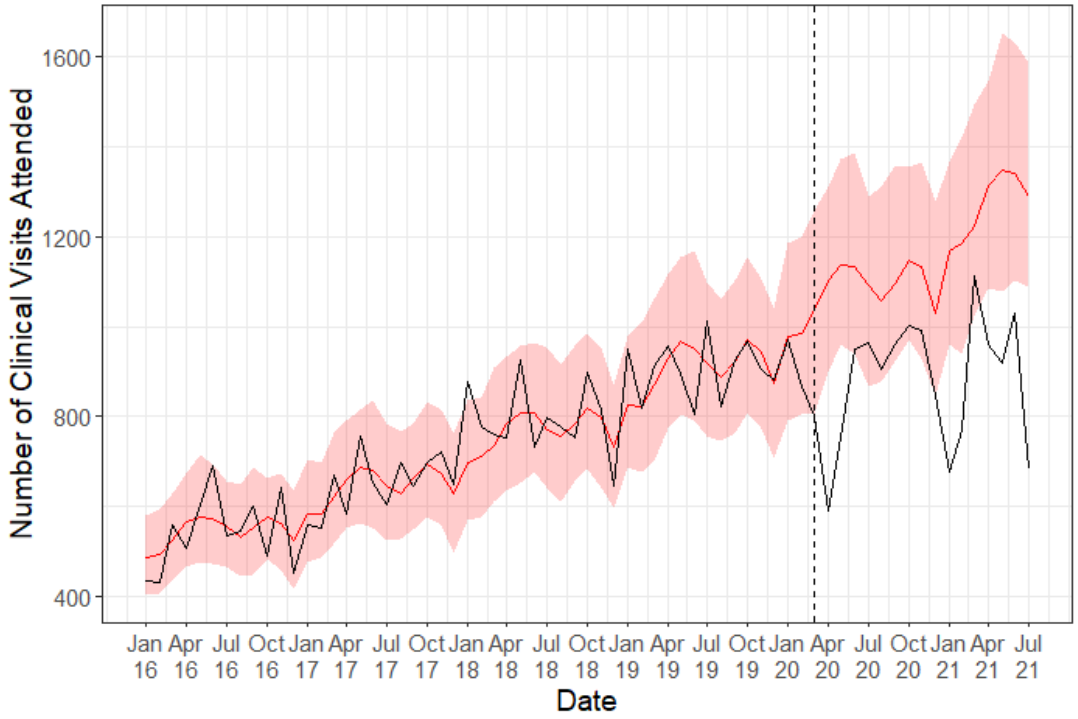
- Established in 2012 as the first cancer center in Rwanda.
- Cancer care services at the BCCOE, include:
  - pathology-based diagnosis,
  - basic imaging,
  - chemotherapy, and
  - surgery.

Methods

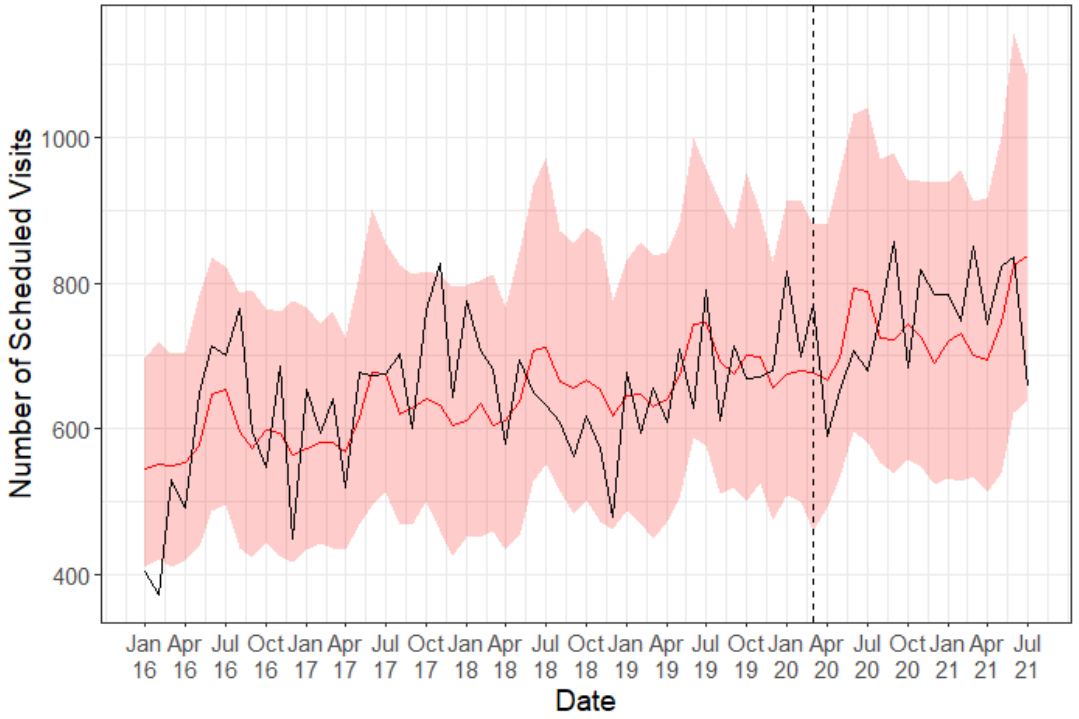
- We collected data on 8,970 patients who were observed during the study period:
  - 7,140 patients in pre-COVID-19 (January 2016 – February 2020)
  - 1,830 patients during COVID-19 (March 2020 – July 2021)
- Measured outcomes, were the monthly number of new patients, number of clinical visits attended, number of scheduled appointments, and proportion of timely visits.
- We did fit a generalized linear model with negative binomial distribution to predict outcomes for the COVID-19 period.
- We computed monthly deviations (i.e. observed minus predicted count), and percent deviations.
- All estimates were computed along with 95% prediction intervals.

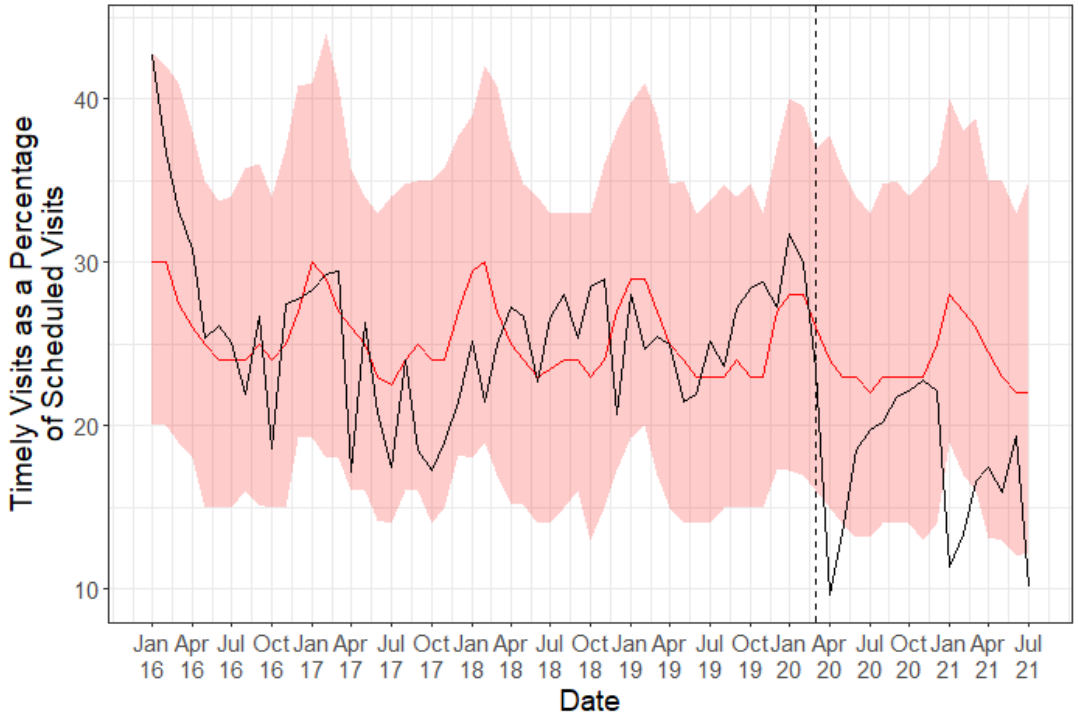
Time series models of new patients and clinical visits attended in pre-COVID-19 (January 2016 – February 2020) and during the pandemic (March 2020 – July 2021)





Time series models of scheduled appointments and timely visits as a percentage of scheduled appointments in pre-COVID-19 (January 2016 – February 2020) and during the pandemic (March 2020 – July 2021)





Cumulative counts and estimated deviations of outcomes during the COVID-19 period (March 2020 – July 2021)

Outcome	Observed Count	Expected Count	Estimated Deviation	Est. Percent Deviation (95% PI)
New Patients	1900	2425.5	-525.5	-21.7% (-31.3%, -11.7%)
Scheduled Visits	12741	12610.5	130.5	1.0% (-10.1%, 13.1%)
Clinical Visits Attended	14911	19889.0	-4978.0	-25.0% (-31.1%, -19.1%)
Timely Visits (%)	298.2	413.5	-115.3	-27.9% (-39.8%, -14.1%)

Discussion

- We observed a significant drop in access to cancer care at the BCCOE during the COVID-19.
- This could be attributed to the imposed measures to halt the spread of COVID-19 in Rwanda, including:
  - national and regional lockdowns,
  - restrictions on movements of people between places, and
  - suspension of public transport.
- We particularly reported the largest declines in April 2020, January-February 2021 and July 2021 when these measures were imposed in Rwanda.
- Our findings suggest delayed cancer diagnosis and treatment, which both may lead to negative health outcomes among our patient population in the coming months and years.

Thank you!!

To submit Q&A questions, go to www.menti.com & enter code 5535 6338

Implementation and evolution of a community health worker-led COVID-19 contact tracing intervention in Chiapas, Mexico

November 4, 2022

Zeus Aranda Remon
Research & Impact Coordinator, Partners In Health Mexico (Compañeros En Salud)

Compañeros En Salud
Partners In Health

Authors

Wikimedia Commons

Zeus Aranda[1,2], Sandra Vázquez[1], Anuraag Gopaluni[3], Laura Martínez[4], Mayra Ramírez[1], Ariwame Jiménez[1], Daniel Bernal[5], Ana L. Rodríguez[1,6], Selene Chacón[6], Bruno Vargas[1], Isabel R. Fulcher[7,8], Dale A. Barnhart[7,9], Cross-site COVID-19 Syndromic Surveillance Working Group

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Background

- Between February 2020 and mid-August 2022, Mexico reported nearly 7.2 million confirmed COVID-19 **cases** and over 342,000 **deaths**.
- Mexico was the country with the **second highest rate of excess mortality** due to the COVID-19 pandemic for the period January 2020 to December 2021, with 325 estimated deaths per 100,000 inhabitants.
- People living in already **marginalized areas** is more likely to present with severe symptoms of COVID-19 disease.
- **Chiapas**, the poorest state in Mexico, has suffered disproportionately from the ongoing health emergency; it has experienced an exacerbation of pre-existing shortages of health **professionals**, medical **supplies**, and **beds**.

- In this context, SARS-CoV-2 **infection prevention and control interventions** that can reduce the number of cases, especially among high-risk patients who are more likely to require hospitalization, are critically important.

- CONACYT - CentroGeo - GeoInt - DataLab. COVID-19 Tablero México. 2022.
- Ortiz-Hernández L, Pérez-Sastré MA. Inequidades sociales en la progresión de la COVID-19 en población mexicana. Rev Panam Salud Pública. 2020.

Background

- In March 2020, **Compañeros En Salud** implemented a community health worker (**CHW**)-led contact tracing intervention in eight rural communities of the Fraylesca and Sierra Mariscal regions.
- For all patients in eight outpatient clinics who met the Mexican MoH definition for a **suspected COVID-19 case** and their **contacts** who accepted the intervention.
- All data were recorded in a CommCare-based **mobile app**.

Mar 2020

- 1st COVID case in Chiapas
- 45 CHWs assigned to support contact tracing
- CHWs receive PPE and training on contact tracing
- Paper-based data collection entered in a CommCare app by CHW supervisor

Sep 2020

- CHWs begin entering data directly into the App

Oct 2020

- 10 dedicated CHWs assigned to support contact tracing and receive additional incentives
- New version of the contact tracing app ease digital data collection by CHWs

Mar 2021

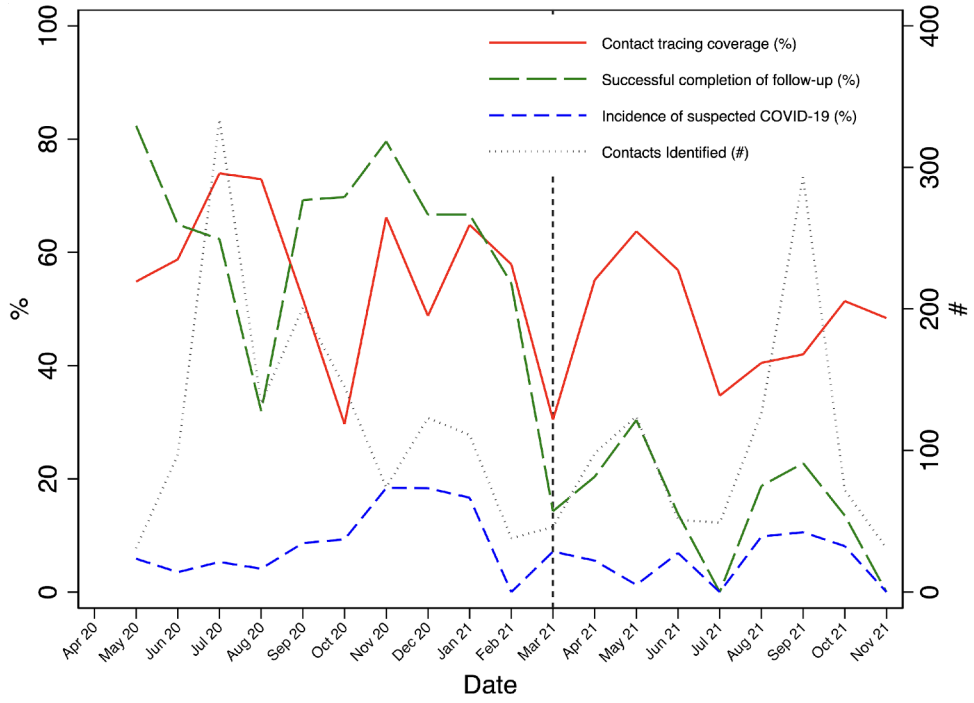
- New algorithm for contact follow-up
- New version of contract tracing app launched to accommodate new follow-up schedule for contacts

Methodology

- In this study we **documented** the implementation and evolution of the intervention and **assessed** a)the evolution of two process indicators (contact tracing **coverage** and successful **completion** of contact tracing) and one outcome indicator (**incidence** of suspected COVID-19 among contacts) using descriptive statistics and b)their association with demographic characteristics of contacts and the intervention period using inferential statistics (univariate and multivariate logistic regression).

Results

- From a roster of 2,177 named contacts, 1,187 (**54.5%**) received at least one home visit by a CHW and 560 (**25.7%**) had successful completion of contact tracing according to intervention guidelines.
- Of 560 contacts with complete contact tracing, 93 (**16.6%**) became suspected COVID-19 cases.
- We observed significant associations between sex and coverage (p = 0.006), sex and complete contact tracing (p = 0.049), community of residence and complete contact tracing (p = 0.005), and intervention period and both coverage and complete contact tracing (p < 0.001).



Evolution of the Compañeros En Salud-contact tracing intervention outcomes from April 2020 to November 2021.

Discussion

- Although we observed statistically significant differences between **genders**, contact tracing coverage and successful completion were less than 60% for both genders, pointing to a need for general programmatic strengthening.
- **Coverage** was lower than in other contact tracing interventions involving CHWs worldwide (71-100%).
- Successful **completion** was also lower than in other interventions (89-100%).
- **Incidence** of suspected COVID-19 among contacts was similar to other contact tracing interventions (in Uganda, Nigeria, and the US), but much higher than in Rwanda (2%) and lower than in Oman (45%).

- Implementation barriers:
  - Extremely limited telephone and internet connection. **In-person** contact tracing is more time-consuming and dangerous than remote contact tracing.
  - Lack of sufficient **training and supervision** of CHWs conducting contact tracing may have negatively affected the intervention outcomes.
  - Lack of **community engagement** during the intervention design and implementation.

- Al Manji A, Tahoun M, Chi Amabo F, Alabri M, Mahmoud L, Al Abri B, et al. Contact tracing in the context of COVID-19: a case study from Oman. BMJ Glob Heal. 2022.
- Nachega JB, Atteh R, Ihekweazu C, Sam-Agudu NA, Adejumo P, Nsanzimana S, et al. Contact Tracing and the COVID-19 Response in Africa: Best Practices, Key Challenges, and Lessons Learned from Nigeria, Rwanda, South Africa, and Uganda. Am J Trop Med Hyg. 2021.
- Lash RR, Moonan PK, Byers BL, Bonacci RA, Bonner KE, Donahue M, et al. COVID-19 Case Investigation and Contact Tracing in the US, 2020. JAMA Netw Open. 2021.

Conclusion

- To our knowledge, our study is the first data-driven evaluation in **Latin America** of a CHW-led COVID-19 contact tracing intervention.

- Our in-depth, data-based assessment of implementation challenges underscores the **importance of early and ongoing evaluation** of these programs to detect pitfalls that may be limiting the effectiveness of interventions, which is particularly relevant when resources are limited, as they can inform more optimal use of existing resources.

¡GRACIAS POR SU ATENCIÓN!

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La injusticia tiene cura.

Socios En Salud
Partners In Health

Seroprevalence of SARS-CoV-2 infection in Carabayllo, Lima Peru

Dr. Marco Tovar
Director Médico, Socios En Salud

Socios En Salud
Partners In Health

Introduction

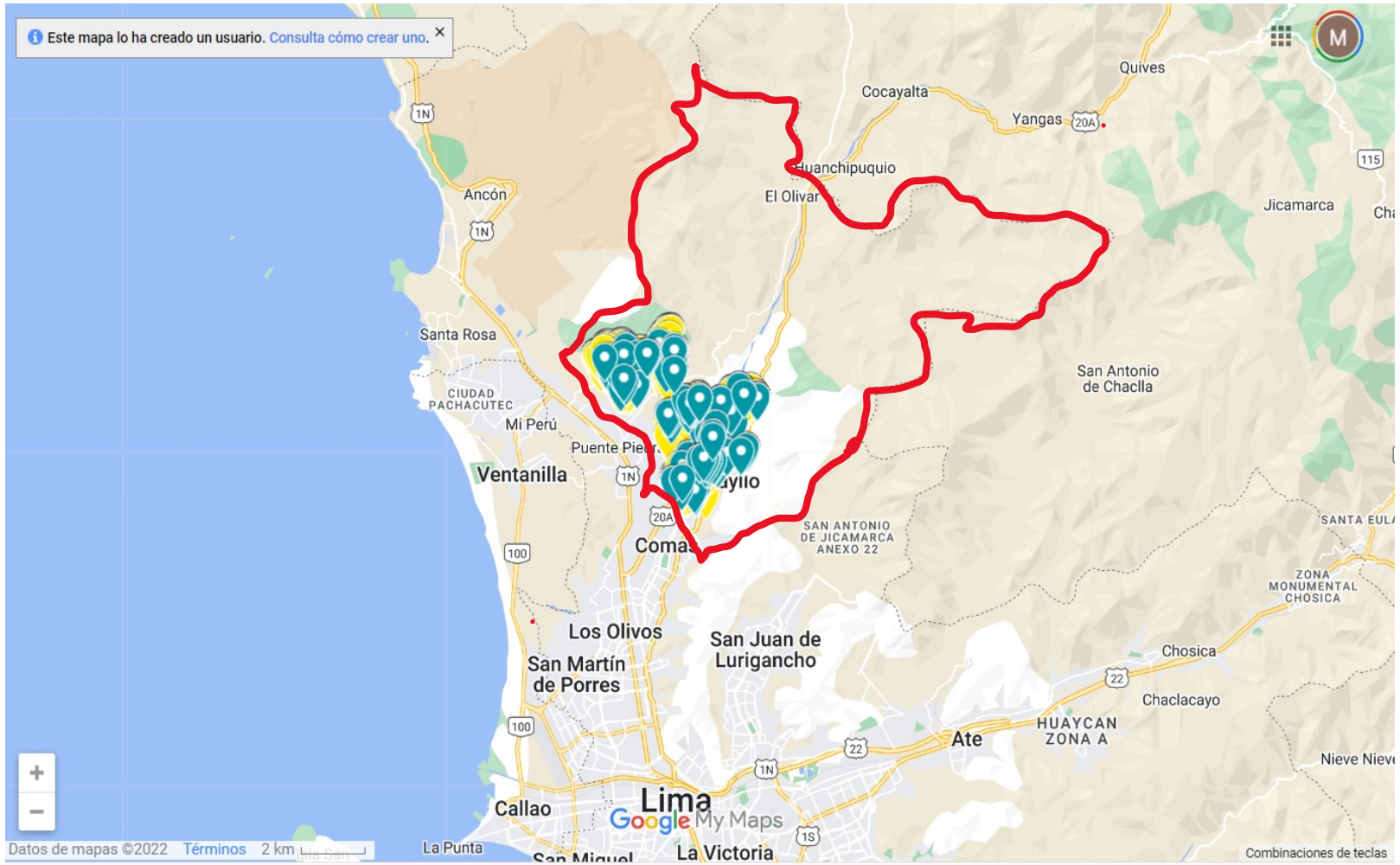
Serological surveillance provides estimates of population-level immunity against infectious diseases using cross-sectional studies of antibody prevalence

In Perú, one surveillance in Lambayeque was done in June 2020 showed 29.5% of seroprevalence,[1] another one in Iquitos estimated a seroprevalence of 70% (IC 95%: 67-73) in July 2020 and 66% (95% IC: 62-70) at August 2020(12).[2] The largest seroprevalence study of SARS-CoV-2 in Lima showed 20.8% (95% IC: 17,2-23,5). [3]

To inform policy makers of DIRIS Lima North (dependence on MoH), we did cross-sectional, observational serosurvey study conducted between November and December 2020 in the district of Carabayllo to evaluate the seroprevalence of SARS-CoV-2 infection.

1. Diaz-Velez, C., et al., *SARS-CoV-2 seroprevalence study in Lambayeque, Peru. June-July 2020.* PeerJ, 2021. **9**: p. e11210.
2. Alvarez-Antonio, C., et al., *Seroprevalence of anti-SARS-CoV-2 antibodies in Iquitos, Peru in July and August, 2020: a population-based study.* Lancet Glob Health, 2021. **9**(7): p. e925-e931.
3. Reyes-Vega, M.F., et al., *SARS-CoV-2 prevalence associated to low socioeconomic status and overcrowding in an LMIC megacity: A population-based seroepidemiological survey in Lima, Peru.* EClinicalMedicine, 2021. **34**: p. 100801.

Methodology



The sampling scheme was designed to represent the entire Carabayllo population. The observational serosurvey study was conducted between November and December 2020.

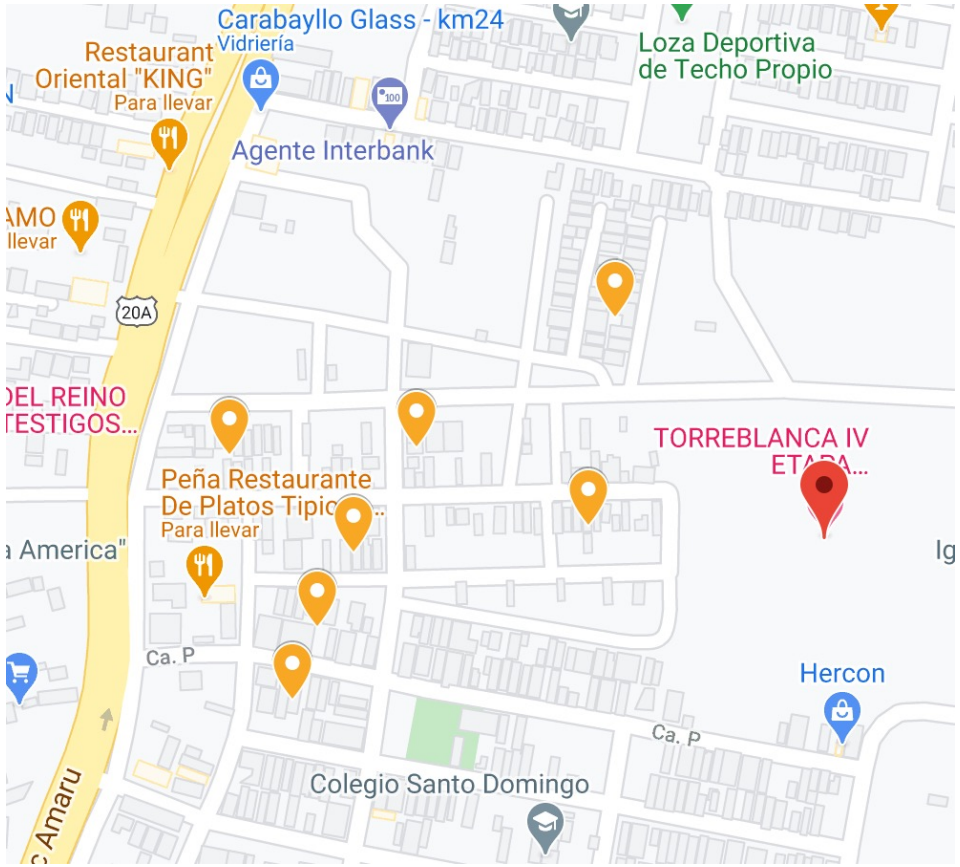
SARS-CoV-2 IgM and IgG antibodies were tested using STANDARD Q COVID-19 IgM/IgG Duo Test by fingerpick as indicated by the manufacturer.

Methodology

We used Carabayllo maps from Google Maps Platform (reference: https://mapsplatform.google.com), using licensed ArcGIS Pro version 10.3 (reference: https://www.esri.com/en-us/arcgis/products/arcgis-pro/overview).

We defined equal-size clusters in the Carabayllo map, in each cluster we make sure that it has a minimum of 10 blocks and a maximum of 16 blocks of houses, for each block of houses up to three locations were manually selected using ArcGIS, obtaining up to 35 locations from each cluster

Methodology



A table of random numbers only 7 locations were selected of each cluster: 5 were to visit and 2 were backup in case any of the 5 locations is not possible to visit, the use of the 2 locations was in case it is not a dwelling, it is a dwelling but there are no inhabitants or there is one housing, inhabitants but do not want to be evaluated.

Methodology

- We estimated the proportion of individuals who had a positive result for either IgG and/or IgM by calculating weights to ensure the age and sex distribution of the study participants matched the population of Carabayllo (Table 1).

- To compare adjusted seropositivity across demographic and clinical characteristics, we estimated the prevalence ratio using generalized linear mixed models with a random intercept to account for household clustering.

- We also provide overall seroprevalence estimates adjusted for imperfect accuracy of the antibody test using the method proposed by Diggle.[4] Specifically, we utilize the specificity estimate (95.1%) and sensitivity estimates based on date of symptom onset (68.9%-99.1%) reported in the STANDARD Q COVID-19 IgM/IgG Duo Test pamphlet. [5]

- We performed all data analysis using the statistical software Stata version 15.0 (Stata Corp LP, College Station, Texas).

4. Diggle, P.J., *Estimating Prevalence Using an Imperfect Test.* Epidemiology Research International, 2011. **2011**: p. 608719.
5. Avantika. SD Biosensor COVID-19 [Internet]. 2020. p. 1–2. Available from: www.sdbiosensor.com

Resultados

Figure 1: Flow chart

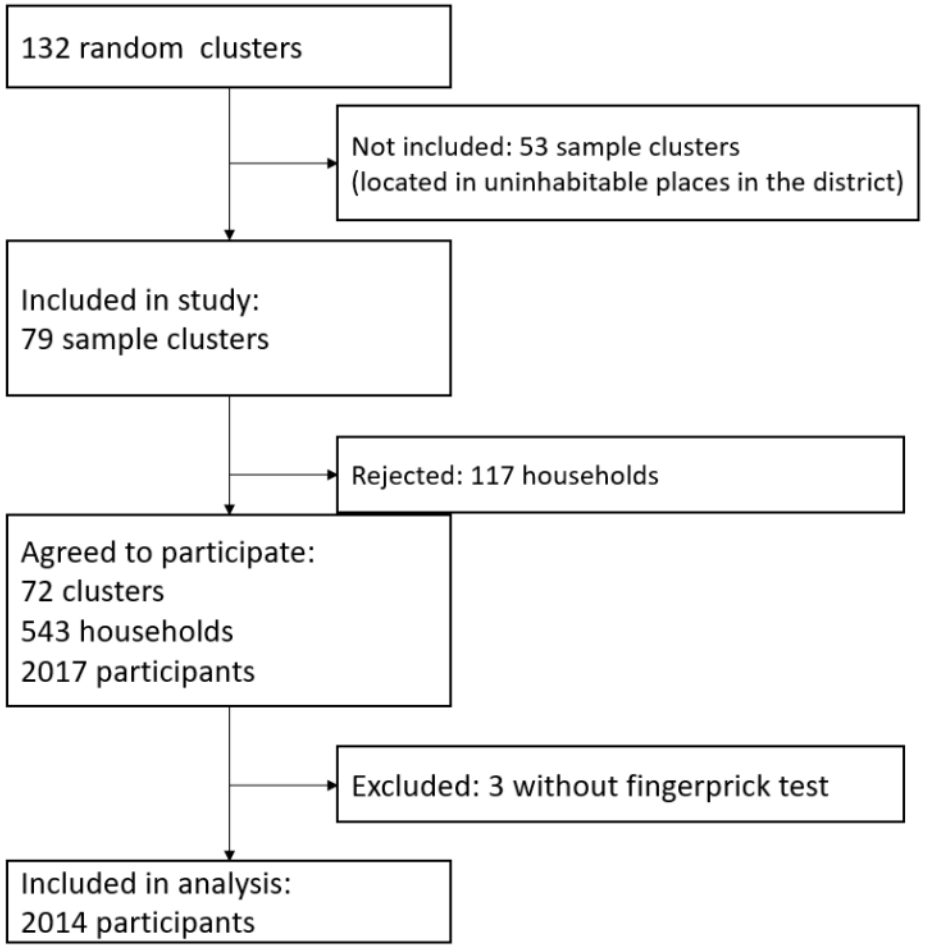


Table 1: Distribution of sex and age for the source and study population

	Study Population (N = 2014)	Source Population** (N = 321,752)
Females % (95CI)	59.9 (57.8 - 62.1)	50.6
0-11	16.6	20.4
12-17	10.1	10.6
18-29	21.8	22.7
30-59	39.7	37.8
60-more	11.8	8.5
Males % (95CI)	40.1 (37.9 - 42.2)	49.4
0-11	26.8	20.6
12-17	12.3	11.1
18-29	16.2	20.9
30-59	31.3	37.7
60-more	13.4	9.8

Females were slightly overrepresented in the study population, but the age distributions within each gender are similar

Resultados

Table 2: Seroprevalence estimates by various sensitivity estimates from the STANDARD Q COVID-19 IgM/IgG Duo Test

Days after symptom onset	Sensitivity estimate	Seroprevalence estimate (95% CI)
< 7 days	0.6889	31.4 (27.5 - 35.7)
7 – 14 days	0.8795	24.2 (21.2 - 27.5)
≥ 7 days*	0.9433	22.4 (19.7 - 25.5)
> 14 days	0.991	21.3 (18.7 - 24.2)

Resultados

Table 3: The proportion of infected individuals stratified by sex and age

	N	Females % (95%CI)	N	Males % (95%CI)	N	Total % (95%CI)
Total	**310**	**25.0 (21.8 - 28.4)**	**191**	**25 (22.1 - 28.1)**	**501**	**25.0 (22.5 - 27.7)**
<11	33	16.4 (11.8 - 22.4)	34	15.7 (11.3 - 21.4)	67	16.1 (12.5 - 20.5)
12-17	23	18.9 (12.7 - 27.1)	14	14.1 (8. 7 - 22.2)	37	16.5 (12.2 - 21.9)
18-29	59	22.4 (17.6 - 28.1)	32	24.4 (17.8 - 32.5)	91	23.4 (18.9 - 28.5)
30-59	150	31.3 (27.1 - 35.9)	86	34.0 (28.4 - 40.1)	236	32.6 (28.7 - 36.8)
60 or more	45	31.7 (24.6 - 39.7)	25	23.1 (16.2 - 31.9)	70	27.2 (21.7 - 33.5)

Resultados

Table 4: The proportion of individuals infected by SARS-CoV-2 stratified by presence of symptoms

Asymptomatic						
	N	Females % (95%CI)	N	Males % (95%CI)	N	Total % (95%CI)
Total	**219**	**23.6 (20.5 - 27.0)**	**139**	**22.4 (19.0 - 26.2)**	**358**	**23.0 (20.3 - 25.9)**
≤11	27	17.1 (11.9 - 23.9)	28	15.1 (10.5 - 21.4)	55	16.1 (12.3 - 20.8)
12-17	18	18.2 (11.5 - 27.5)	11	13.4 (7.6 - 22.5)	29	15.8 (11.1 -21.9)
18-29	39	20.1 (14.9 - 26.6)	22	20.8 (14.1 - 29.5)	61	20.4 (16.0 - 25.7)
30-59	104	29.9 (25.2 - 35.0)	58	30.9 (24.3 - 38.0)	162	30.4 (26.0 - 35.2)
60 +	31	29.2 (21.5 - 38.5)	20	22.7 (15.3 - 32.5)	51	25.7 (19.8 - 32.5)

Symptomatic (Had/Have)						
	N	Females % (95%CI)	N	Males % (95%CI)	N	Total % (95%CI)
Total	**91**	**29.2 (23.7 - 35.3)**	**52**	**35.0 (27.8 - 43.0)**	**143**	**31.8 (26.9 - 37.1)**
≤11	6	14.0 (6.4 - 27.9)	6	19.4 (8.9 - 37.0)	12	16.1 (9,4 - 26.3)
12-17	5	21.7 (9.3 - 43.0)	3	17.6 (6.0 - 41.7)	8	19.8 (10.6 - 33.8)
18-29	20	29.0 (19.5 - 40.8)	10	40.0 (22.8 - 60.0)	30	33.3 (23.4 - 45.0)
30-59	46	35.1 (27.1 - 44.1)	28	43.1 (32.0 - 54.9)	74	38.9 (31.8 - 46.5)
60 +	14	38.9 (24.2 - 55.9)	5	25.0 (10.7 - 48.2)	19	32.7 (20.8 - 47.2)

Limitations

- It is possible that some persons infected were not identified during the serosurvey due to delayed seroconversion due to a recent SARS-CoV-2 infection or seroreversion due to waning antibody response.

- Nevertheless, our sampling scheme as opposed to convenience estimates decreases these issues.

Conclusions

- The study shows that the proportion of people with evidence of infection in this population after the first wave is low compared to that reported in other studies.

- At the same time, the results indicate that there is a large susceptible population that could be affected again, while there was no access to the vaccine that could be complemented maintained other infection control measures.

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Childhood immunization during the COVID-19 pandemic: experience in Haiti, Lesotho, Liberia and Malawi

Emilia Connolly DO MPH

Abwenzi Pa Za Umoyo | November 2022

Partners In Health

AUTHOR ACKNOWLEDGEMENT

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INTRODUCTION

- COVID-19 pandemic interrupted essential services such as immunizations[1]
  - Early pandemic models predicted severe interruptions and resulting increased mortality[2,3]
- COVID-19 mitigation measures had unintended effects on health service delivery[4,5]
- Gaps in sustained monitoring beyond initial prevention measures

1. Hartley and Perencevich 2020
2. Abbas et al 2020
3. Roberton et al. 2020
4. Haider et al 2020
5. WHO Pulse survey 2020

OBJECTIVE

To examine changes in vaccination of children younger than 1 year during the COVID-19 pandemic (March 2020-August 2021) in Haiti, Lesotho, Liberia and Malawi

- 4 countries, 10 districts, 41 facilities and 6.4 million people
- Allowed for investigation in varied geographic regions with different populations and mitigation measures and their practical application at local level
- How can this help maintain immunization programmes and other essential services during acute health crises?

METHODS

Utilized negative binomial regression modeling[6] from existing routine health information systems

- Accounted for yearly and seasonal trends with historical data from Jan 2016 to Feb 2020*
- Utilized models to extrapolate expected immunization counts without the pandemic with 95% confidence intervals
- Reported cumulative difference in number of vaccinations and percent difference during three periods in the pandemic: Early (Mar-Aug 2020), Middle (Sep 2020-Feb 2021), Late (Mar-Aug 2021) with Total (Mar 2020-Aug 2021)
- Analysis and visualizations done in R v4.0.4

Exclusions

- Missing data for more than 20% baseline months or vaccine dose was missing data for any months in evaluation period (fit model assuming the data were missing at random)
- 301 facility indicator combinations, 8 (2.7%) were excluded

*Except for Haiti which started from January 2017

6. Fulcher et al. 2021

BASELINE DATA

Table 3. **Vaccinations administered monthly by country before the COVID-19 pandemic, January 2016–February 2020**

Vaccine (dose)	Vaccinations administered a month, median no. (IQR)			
	Haiti	Lesotho	Liberia	Malawi
Bacillus Calmette–Guerin (1)	947.0 (797.0 to 1 114.5)	79.5 (66.2 to 93.8)	193.0 (158.2 to 233.8)	488.5 (422.8 to 549.8)
Oral or inactivated polio (0)	338.5 (245.8 to 411.0)	63.5 (51.5 to 71.0)	156.5 (125.0 to 186.5)	NA
Oral or inactivated polio (1)	766.5 (609.5 to 1 045.0)	95.0 (84.2 to 106.8)	218.0 (175.5 to 247.8)	501.5 (434.5 to 743.0)
Oral or inactivated polio (2)	707.5 (453.5 to 900.5)	NA	203.0 (160.8 to 229.0)	435.5 (361.8 to 467.8)
Oral or inactivated polio (3)	491.5 (352.2 to 590.5)	89.5 (76.0 to 95.8)	208.5 (174.5 to 243.0)	463.5 (394.2 to 501.2)
Pentavalent (1)	791.5 (654.2 to 1 071.0)	100.0 (79.0 to 106.0)	218.0 (175.5 to 247.8)	474.0 (388.2 to 514.0)
Pentavalent (2)	700.0 (538.8 to 909.2)	NA	203.0 (160.8 to 230.5)	438.0 (367.2 to 463.8)
Pentavalent (3)	612.0 (532.8 to 835.8)	86.5 (74.5 to 95.8)	208.5 (175.2 to 243.0)	462.5 (397.2 to 506.0)
Pneumococcal conjugate (1)	635.7 (381.1 to 857.0)	NA	218.0 (175.5 to 246.2)	466.5 (401.2 to 519.0)
Pneumococcal conjugate (2)	443.3 (208.0 to 668.8)	NA	203.0 (160.8 to 229.0)	440.5 (366.5 to 463.0)
Pneumococcal conjugate (3)	289.7 (143.1 to 464.5)	NA	208.5 (174.5 to 243.0)	459.5 (393.5 to 507.0)
Rotavirus (1)	743.5 (592.2 to 986.5)	NA	216.5 (159.2 to 242.2)	470.5 (368.2 to 503.2)
Rotavirus (2)	675.0 (484.0 to 843.5)	NA	197.5 (129.2 to 223.5)	431.5 (354.0 to 471.8)
Measles (1)	564.0 (489.0 to 690.0)	78.0 (62.2 to 92.8)	181.5 (139.0 to 222.2)	259.5 (0.0 to 486.8)

Covid-19: coronavirus disease 2019; IQR: interquartile range; NA: data not available.

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RESULTS

Overall Vaccination Deficits March 2020 – August 2021

- All countries except Libera had a cumulative deficit for the 14-dose combination
- Only significant changes were a deficit for rotavirus doses 1 and 2 in Liberia and all vaccine-dose combinations in Malawi

Country	Cumulative % Difference
Haiti	-5.1% (-16.8% to 19.9%)
Lesotho	-5.9% (-16.3% to 10.1%)
Liberia	+8.0% (-21.1% to 15.9%)
Malawi	-2.0% (-14.1% to 12.6%)

March – August 2020

- Declines except for Malawi
- Statistically significant drops in measles for Haiti, Lesotho & Liberia with ending upward trend

Sep 2020 – February 2021

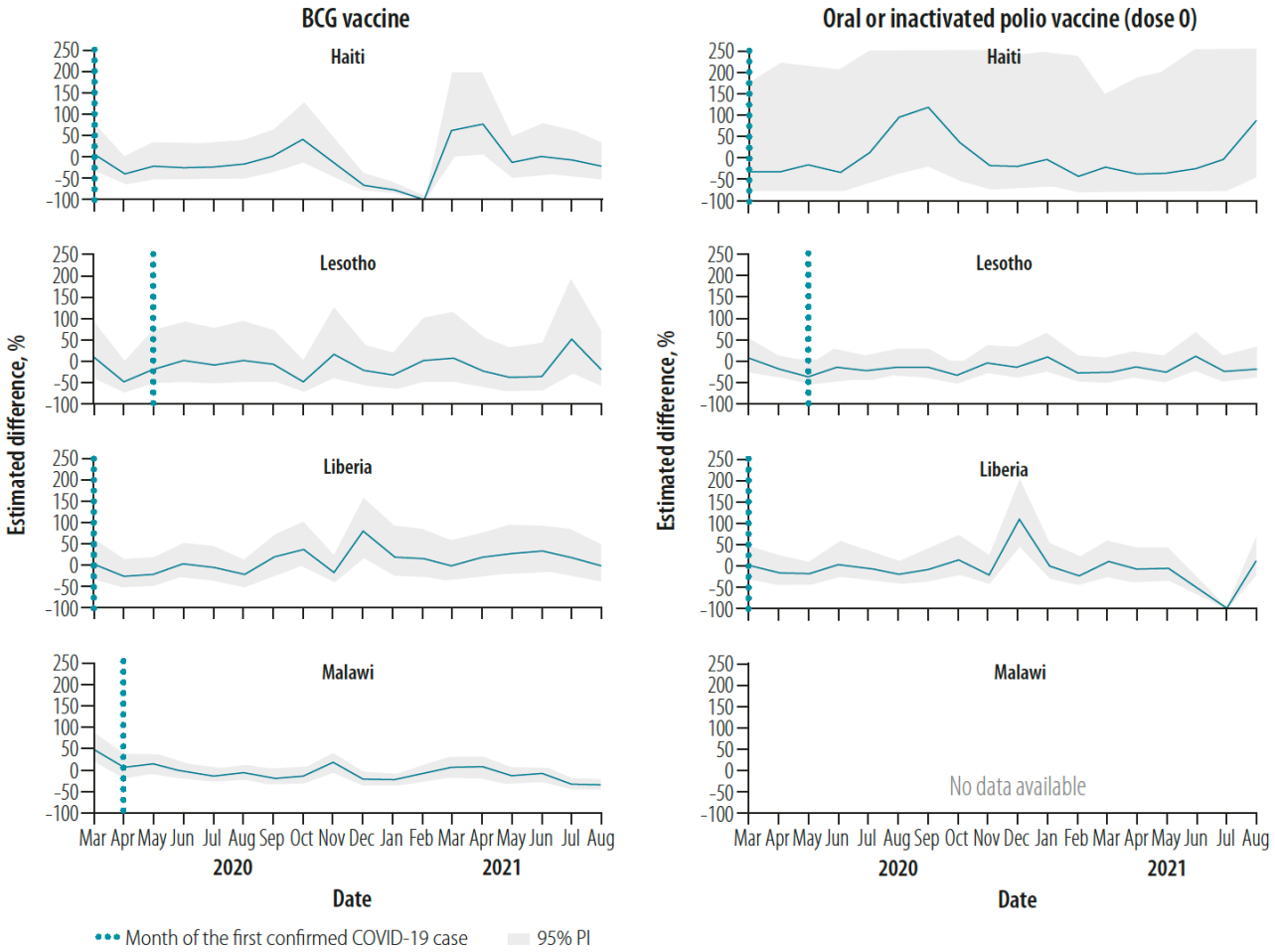
- Most returned to expected levels with decreases at the end of the period

March – August 2021

- Vaccination levels returned to expected or above baseline except in Malawi

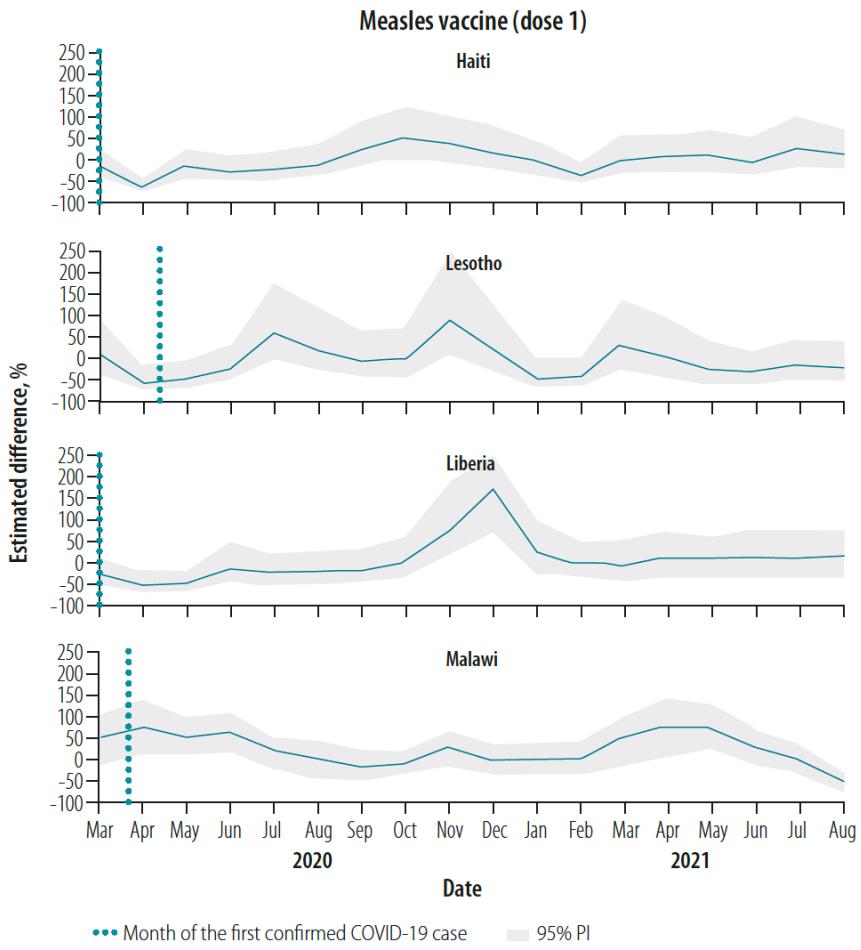
SELECTED RESULTS REVIEW

Fig. 1. **Estimated per cent difference from expected in vaccine doses given at age 0 weeks, by month and country, March 2020–August 2021**



BCG: Bacillus Calmette–Guerin; COVID-19: coronavirus disease 2019; PI: prediction interval.
Note: We only show 95% prediction intervals within 250% difference (details in data repository).[28]

Fig. 5. **Estimated per cent difference from expected in vaccine doses given at 36 weeks, by month and country, March 2020–August 2021**



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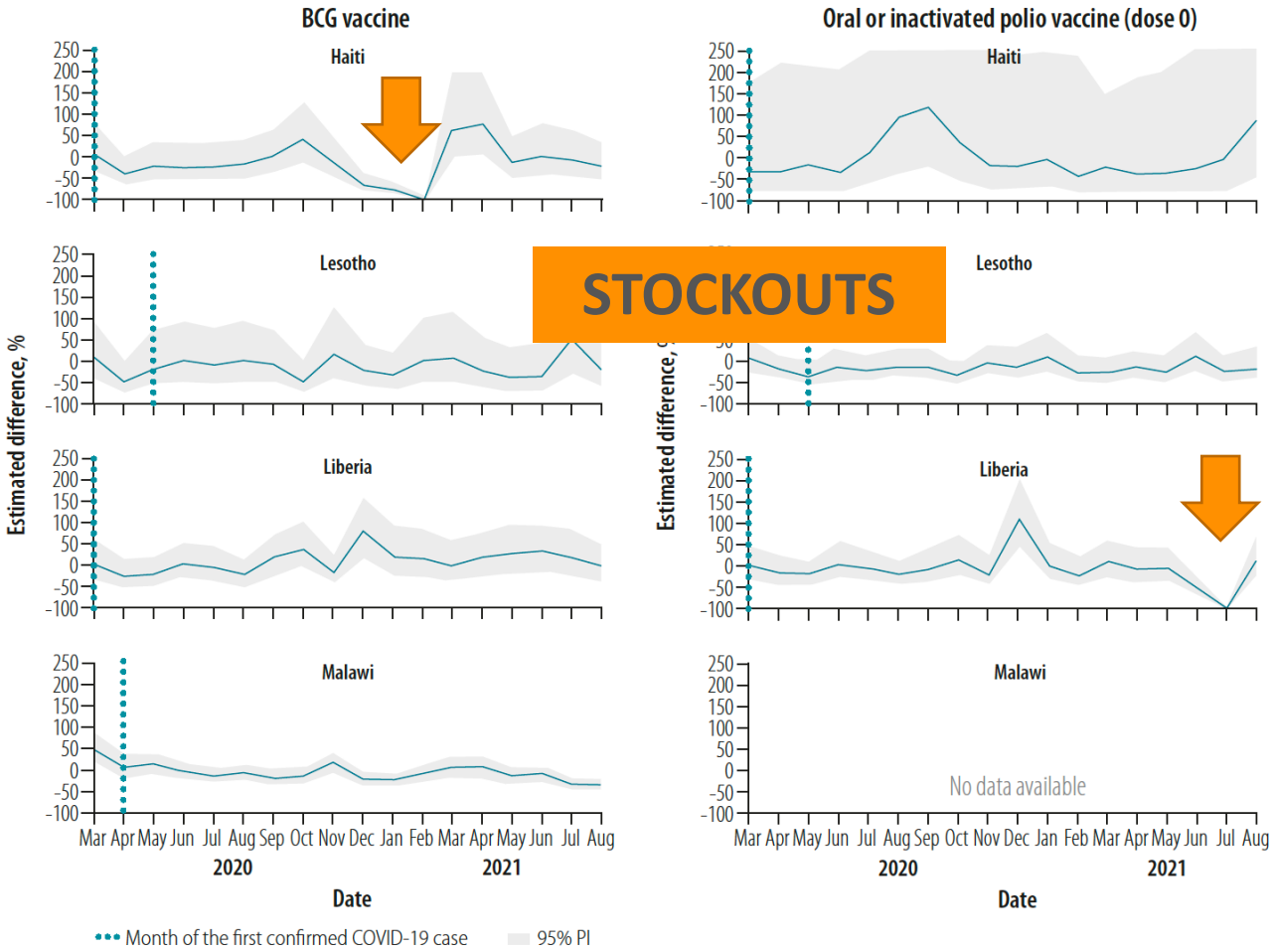

STOCKOUTS

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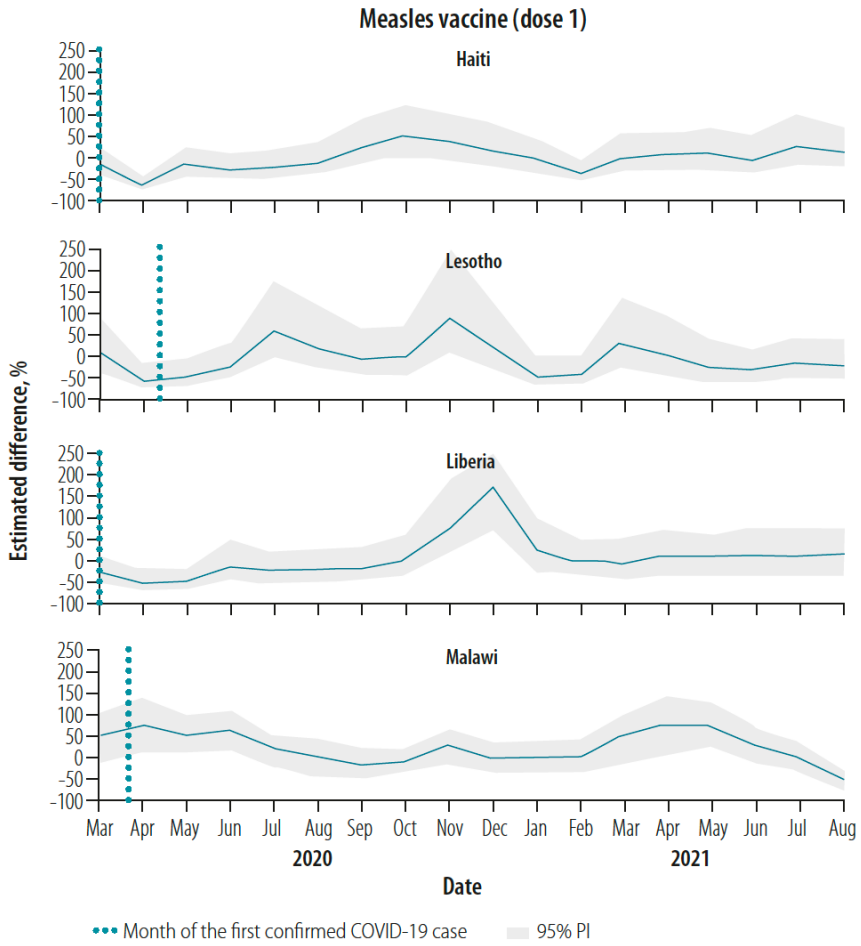

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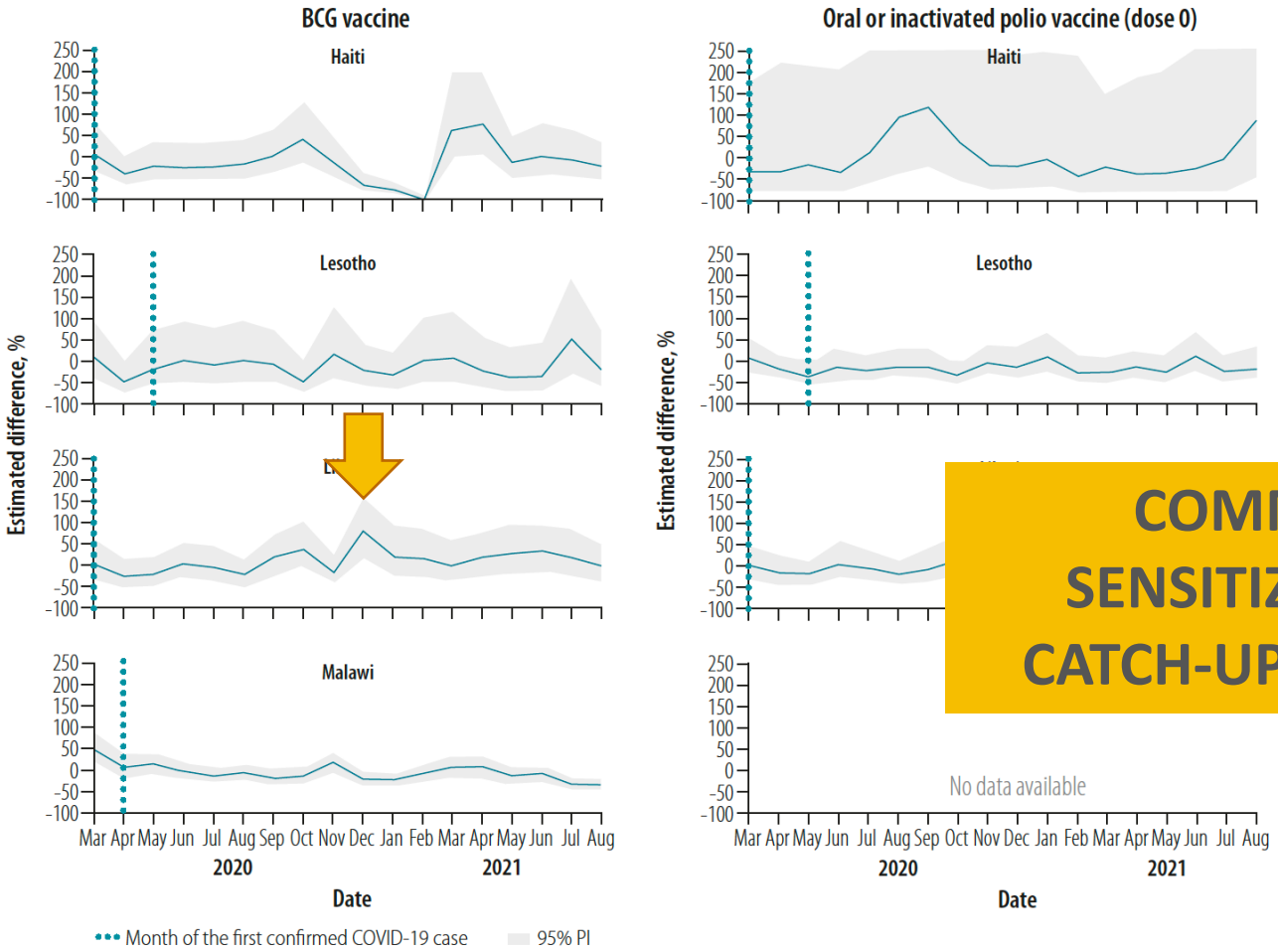

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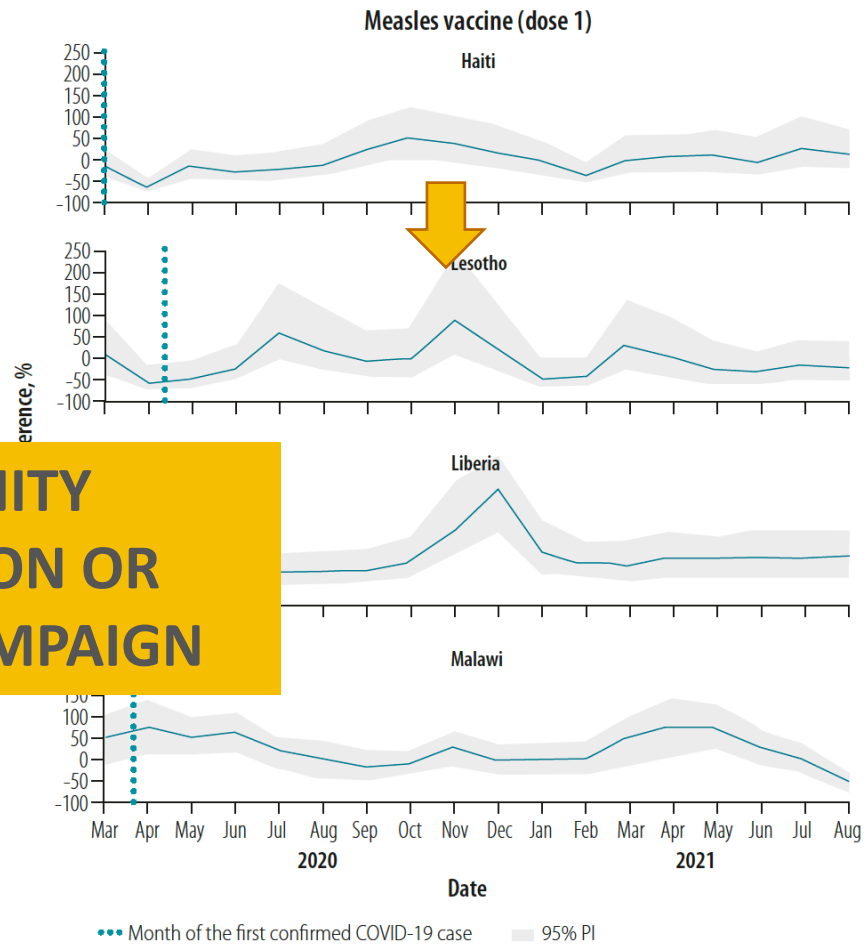
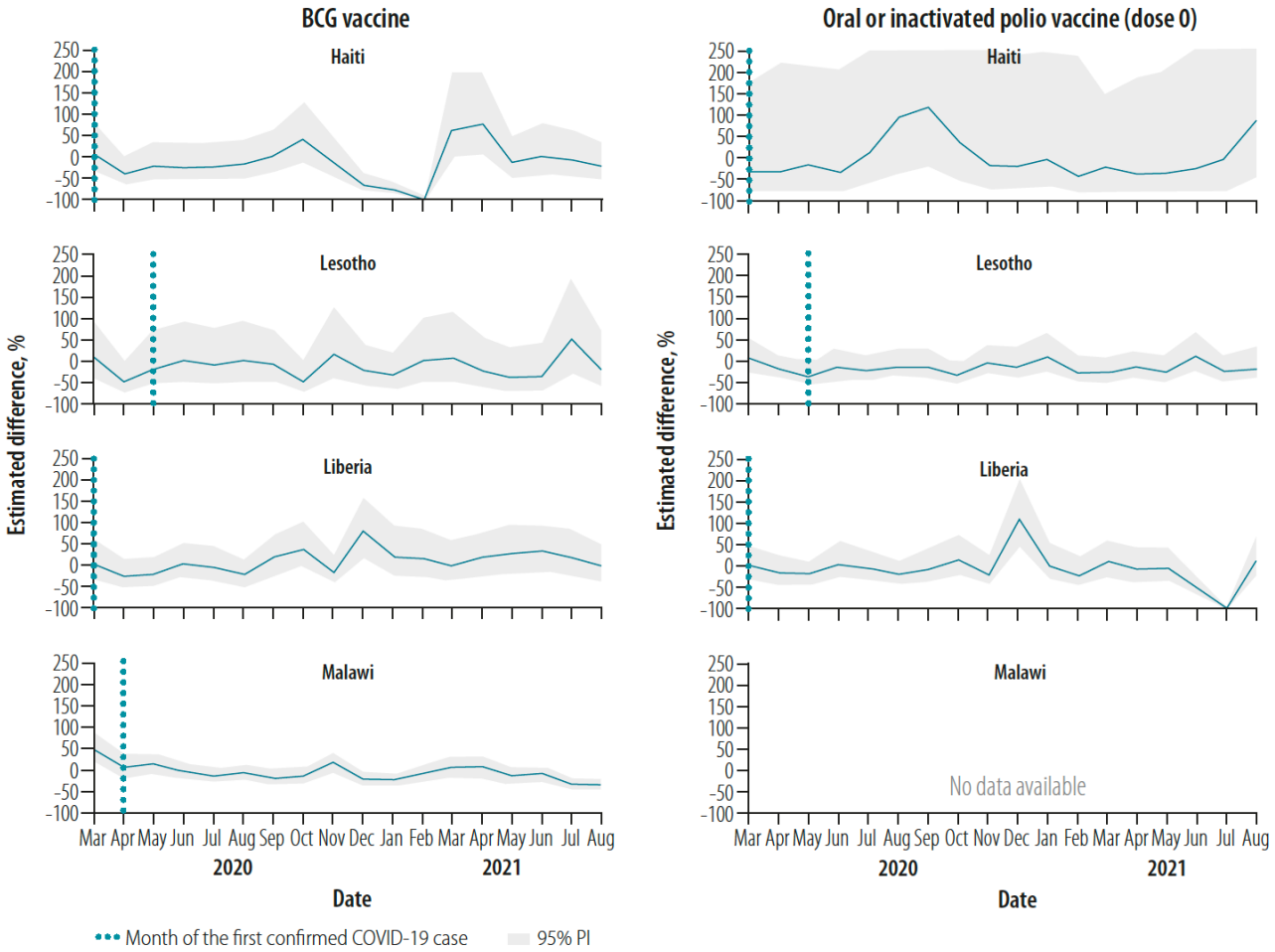


COMMUNITY SENSITIZATION OR CATCH-UP CAMPAIGN

SELECTED RESULTS REVIEW

Fig. 1. **Estimated per cent difference from expected in vaccine doses given at age 0 weeks, by month and country, March 2020–August 2021**



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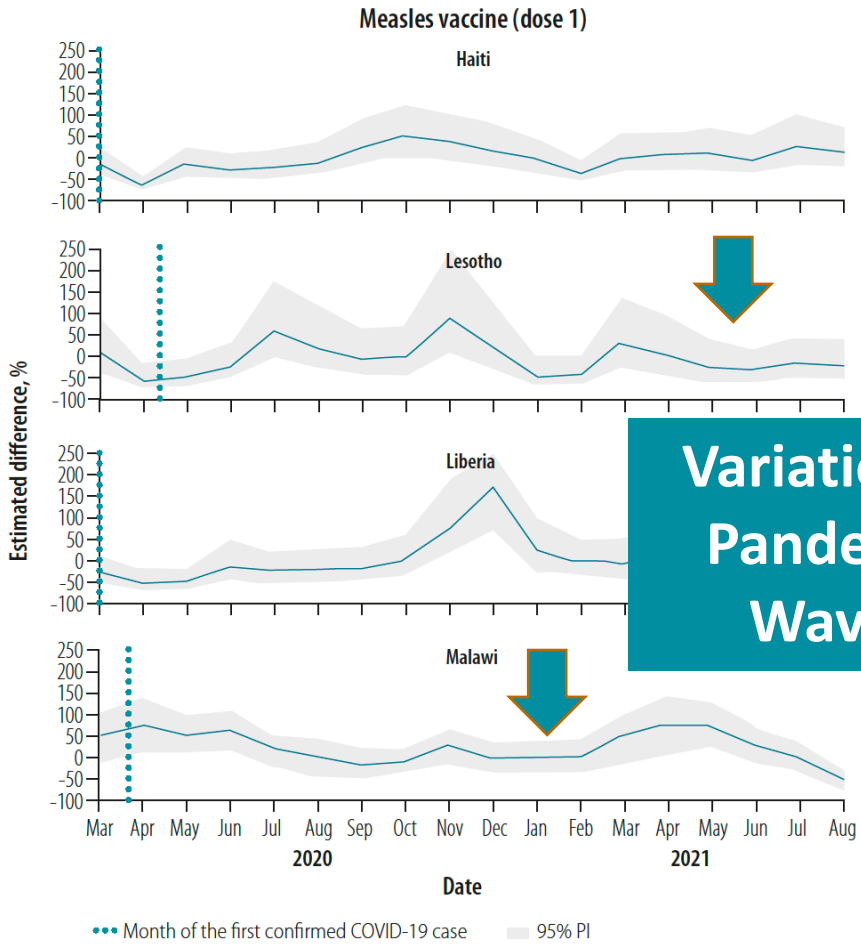

Variation In Pandemic Waves

DISCUSSION

- Initial declines were observed in Europe[10,11], North America[12] and Asia[13] in early 2020
- Now studies in Africa are observing rebounds consistently and dependent on waves of infection[14-16]
- Variations complex and varied by country and even by district. Importance of community health awareness, education and outreach
  - More pronounced declines with older children
- Now juggling with COVID-19 vaccine and other emerging outbreaks and emergencies

Selected Feature	Haiti	Lesotho	Liberia	Malawi
COVID-19 Stringency index[7]*	↑	↑	↑	↓
Cumulative COVID-19 Cases per 1 million[8,9]^	1806	6667	1080	3073
Cumulative case fatality rate[8,9]^	2.8%	2.8%	4.4%	3.6%
Consistent Community outreach	√	√	√	

*At beginning of the pandemic; all dropped by May 2021
^As of 31 August 2021

7. Hale et al. 2021
8. Dong et al. 2020
9. Our World in Data 2021
10. Middeldorp et al 2021
11. McDonald, et al. 2020
12. O'Leary et al. 2021
13. Zhong et al 2021
14. Hategeka et al 2021
15. Spencer et al 2020
16. Shet et al 2020

CONCLUSION

- To ensure vaccine utilization rates are well maintained despite continued waves of COVID-19 and new outbreaks and emergencies, we need to:
  - Contextualize response within health systems with building capacity for health care staff including targeted community outreach clinics
  - Strengthen efforts to educate communities and parents on COVID-19 and the value of childhood vaccinations

To submit Q&A questions, go to www.menti.com & enter code 5535 6338

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Integrating capacity building into our multisite research

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GLOBAL HEALTH RESEARCH CORE

Partners In Health

Acknowledgements

The Cross-Site COVID-19 Research Working Groups

- Overall leads: Jean Claude Mugunga and Megan Murray
- Technical and capacity building leads: Dale Barnhart and Isabel Fulcher
- Site teams
- Volunteers, Interns and Students

Partners In Health

Harvard Medical School

Funders

- Largely unfunded, volunteered time.
- Harvard and PIH core funding
- Canadian Institute for Health Research
- ICODA (Grand Challenges)
- Mercury Project

GLOBAL HEALTH RESEARCH CORE

Partners In Health

Why integrated capacity building?

- We will do better, more impactful research if all are engaged in meaningful ways.

- We all have something to learn and something to teach. And we all want to grow within our careers.

- Historically, opportunities are not fairly shared across all those engaged. We specifically want to address these historical imbalances.

Strategies for capacity building

- **Informal:**
  - Open community meetings
  - Senior- and Peer-mentoring

- **Formal**
  - Short course
  - Writing workshop

Informal

- Biweekly meetings:
  - Present works in progress
  - Give feedback on methods and research.

- Co-creating research works:
  - Opportunities for a range of individuals.
  - Mentoring/coaching for those leading the work.

Childhood immunization during the COVID-19 pandemic: experiences in Haiti, Lesotho, Liberia and Malawi

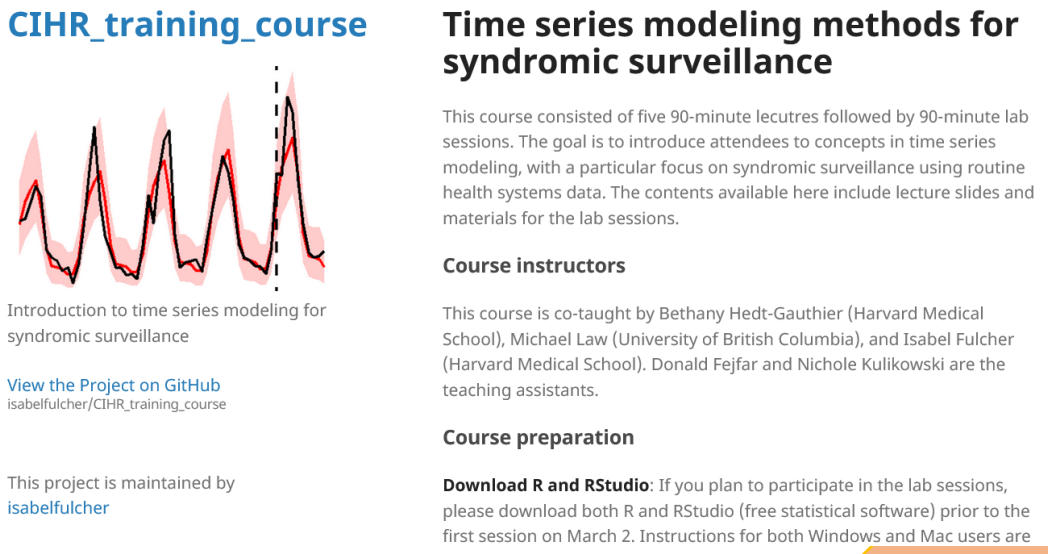
Emilia Connolly,[a] Emma J Boley,[b] Donald Luke Fejfar,[c] Prince F Varney,[b] Moses B Aron,[a] Isabel R Fulcher,[d] Wesler Lambert,[e] Melino Ndayizigiye,[f] Michael R Law,[g] Jean-Claude Mugunga[c] & Bethany Hedt-Gauthier[d] on behalf of the Cross-site COVID-19 Syndromic Surveillance Working Group

Objective To examine changes in vaccination of children younger than 1 year during the coronavirus disease 2019 (COVID-19) pandemic (March 2020–August 2021) in Haiti, Lesotho, Liberia and Malawi.
Methods We used data from health management information systems on vaccination of children aged 12 months or younger in districts supported by Partners In Health. We used data from January 2016 to February 2020 and a linear model with negative binomial distribution to estimate the expected immunization counts for March 2020–August 2021 with 95% prediction intervals, assuming no pandemic. We compared these expected levels with observed values and estimated the immunization deficits or excesses during the pandemic months.
Findings Baseline vaccination counts varied substantially by country, with Lesotho having the lowest count and Haiti the highest. We observed declines in vaccination administration early in the COVID-19 pandemic in Haiti, Lesotho and Liberia. Continued declines largely

Time series analysis course

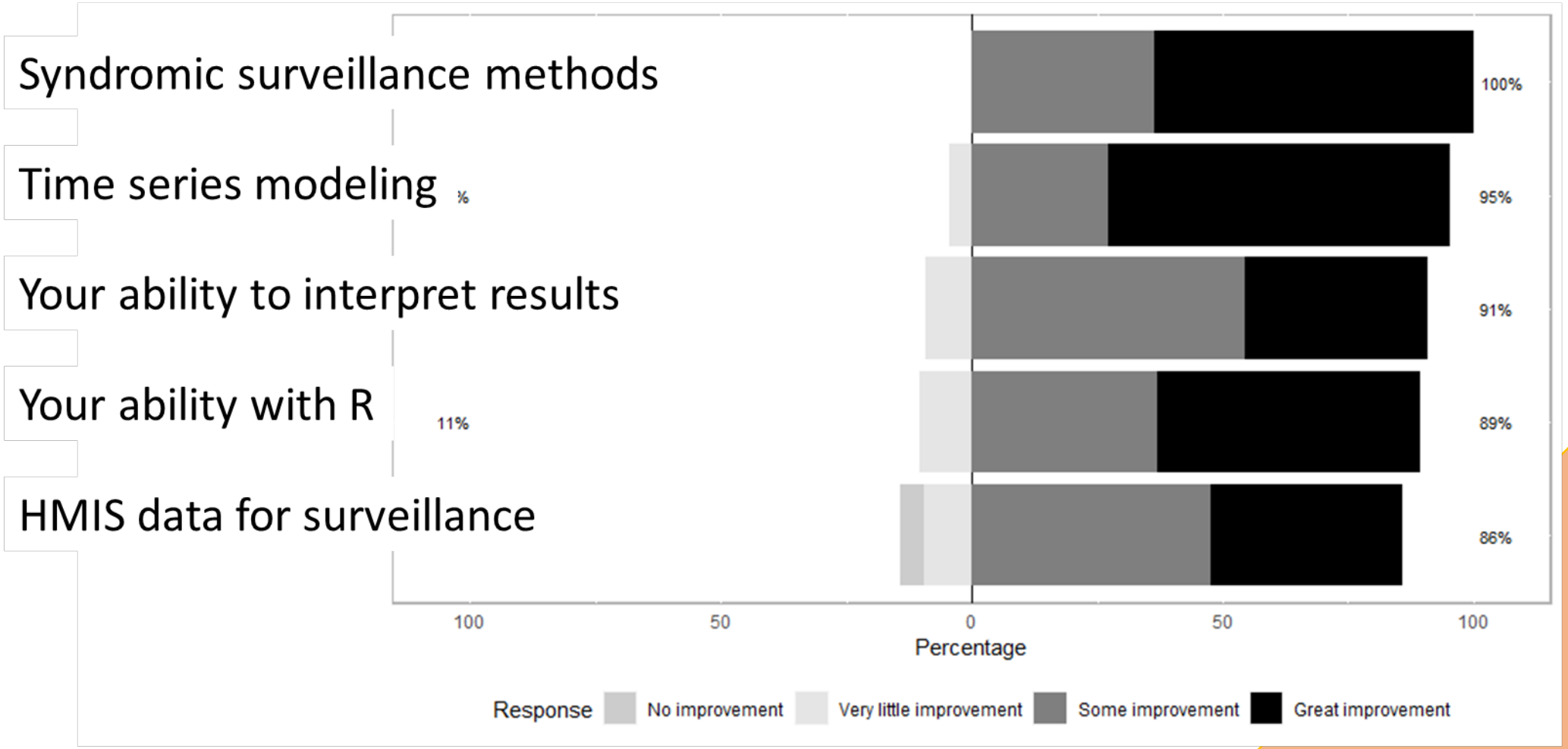
- Objective: Increase confidence in surveillance methods; train statisticians to implement these methods in R.

- Format:
  - Five sessions, fully online
  - 1 hour general content; 2 hours statistical content



https://isabelfulcher.github.io/CIHR_training_course/

Figure 5. How did the course affect your understanding of the following? (N=22)



Writing workshop

- Goal: Support six teams to produce papers from a set of available data.

- Pre-workshop: Met with teams one-on-one to finalize results.

- Workshop: Some core didactic lectures, lots of one-on-one time with mentor support.

Team Sierra Leone: Assessing socio-economic vulnerability and infection prevention among NCD patients during COVID-19 in rural Sierra Leone: a cross-sectional study

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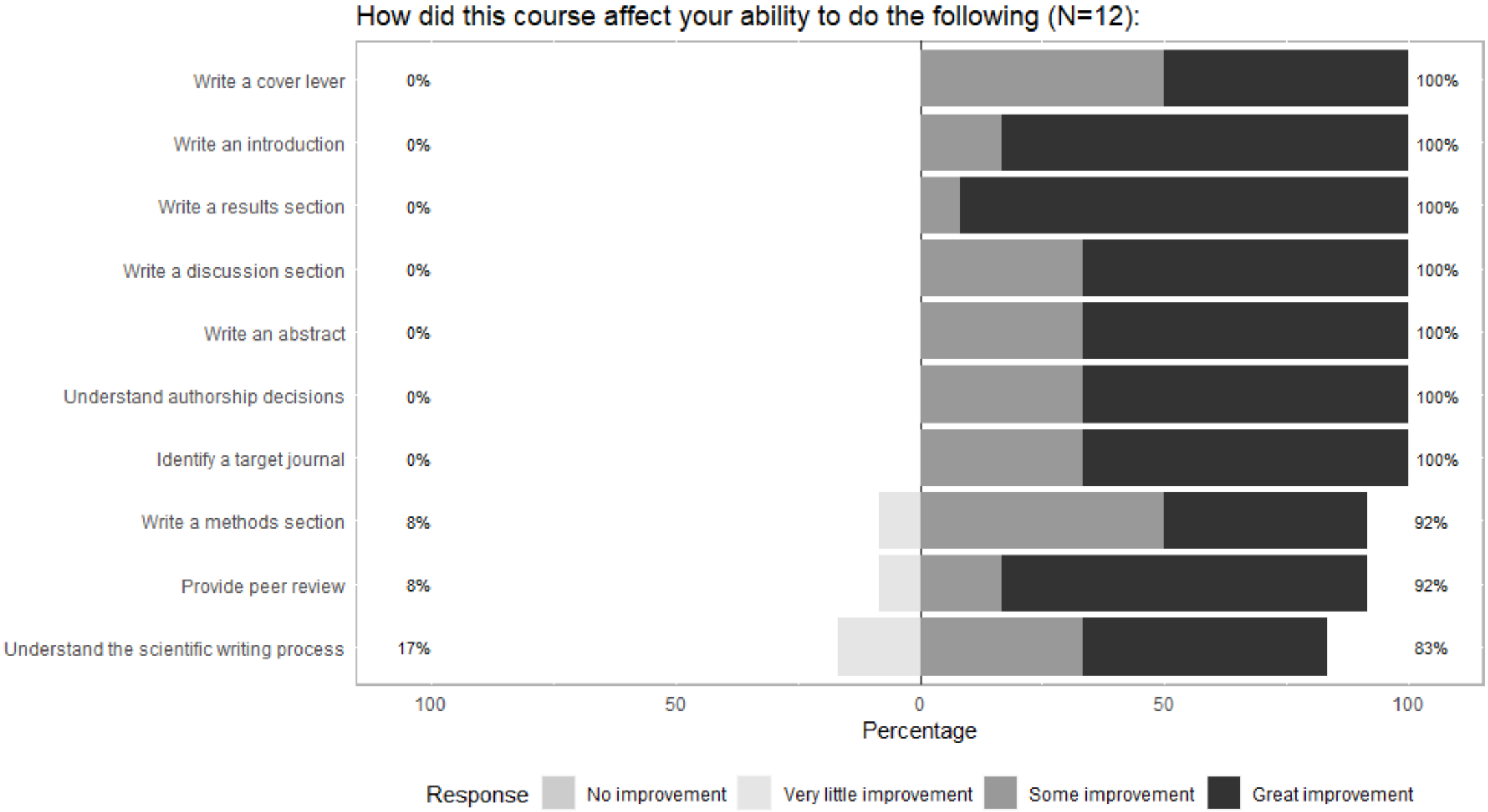

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Lessons learned:

- Lots of interest, more than we could satisfy.
- Must prioritize accompaniment – supporting each other until achieve common goal.
- Not everything for everyone – tailor to the needs of participants and offer enough to cover a range of needs/interests.
- Be sensitive to time-zones and internet connectivity.

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CAT	GMT	EST/PST	CST	PCT
8:00	6:00	1:00	0:00	22:00
9:00	7:00	2:00	1:00	23:00
10:00	8:00	3:00	2:00	0:00
11:00	9:00	4:00	3:00	1:00
12:00	10:00	5:00	4:00	2:00
13:00	11:00	6:00	5:00	3:00
14:00	12:00	7:00	6:00	4:00
15:00	13:00	8:00	7:00	5:00
16:00	14:00	9:00	8:00	6:00
17:00	15:00	10:00	9:00	7:00
18:00	16:00	11:00	10:00	8:00
19:00	17:00	12:00	11:00	9:00
20:00	18:00	13:00	12:00	10:00
21:00	19:00	14:00	13:00	11:00
22:00	20:00	15:00	14:00	12:00
23:00	21:00	16:00	15:00	13:00
0:00	22:00	17:00	16:00	14:00
1:00	23:00	18:00	17:00	15:00
2:00	0:00	19:00	18:00	16:00
3:00	1:00	20:00	19:00	17:00

Questions/Feedback?

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Panel Q&A

Alphonse Nshimyiryo, MS (Virtual)
The impact of COVID-19 on access to cancer care in Rwanda

Zeus Aranda, MS
Implementation and evolution of a community health worker-led COVID-19 contact tracing intervention in Chiapas, Mexico

Marco Tovar, MD
Seroprevalence of SARS-CoV-2 infection in Carabayllo, Peru

Emilia Connolly, MPH, MD
Childhood immunization during the COVID-19 pandemic

Bethany Hedt-Gauthier, PhD
Integrating capacity building into our multisite research