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INEQUALITIES

How covid-19 has exposed the weaknesses in rural healthcare

Rural regions made vulnerable by limited healthcare infrastructure, lower rates of vaccination, and opposition to government policies are the new frontlines in the pandemic. Yet support systems have not adjusted to the growing rural needs for health education, testing, vaccination, and treatment. **Michael Forster Rothbart**, **Kata Karáth**, and **Lungelo Ndhlovu** report from the US, Ecuador, and Zimbabwe

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For Michelle Rodriguez, a covid-19 vaccination day often meant starting work at 4 am. Her tiny healthcare station in Ecuador's tropical Esmeraldas province had no travel budget or vehicles of its own, and she had to rely on her neighbours to drive her to Quininde district hospital to pick up batches of vaccine, making the 4 hour round trip several times during summer 2021. She and the healthcare station's nurse then had to walk through the rainforest, sometimes for hours, to deliver shots to marginalised communities (video 1).

Video 1 The Tipo A health centre in Cristóbal Colón

Rodriguez' experience is not uncommon in Ecuador. She arrived in Cristóbal Colón, a community of fewer than 3000 people, in January 2020. Her contract was scheduled to last a year, to fulfill the rural service required of newly graduated doctors to obtain a medical licence.

"It's one thing to learn what a pandemic is in your university," says John Farfán, former president of the Ecuadorian Association of Rural Doctors (EARD). "It's another thing to go and do your rural year in a place you have never been to, sometimes more than 10 hours away from your home, and face a pandemic with no supplies."

Ecuador's healthcare system is highly fragmented, made up of various public institutions—the Ministry of Public Health, the Ecuadorian Institute of Social Security, and the Institute of the Armed Forces, plus private for-profit and non-profit organisations—that don't necessarily coordinate with one another. Higher level hospital and specialised care is more centralised, but has limited capacity and is not equally distributed. In April 2020, Pichincha province had nine times as many intensive care unit (ICU) beds per capita as Esmeraldas province. Some provinces had no ICU wards.

Nationwide, just 68 intensive care beds are available per million people, and these quickly filled with covid-19 patients. Ecuador has about 22 physicians and 13 nurses per 10 000 people,[1] but only 16% of those (about 9800 professionals) work in rural areas, which are home to 6.32 million people (more than a third of the total population).

When the pandemic hit, Ecuador's government channeled emergency public funds to manage the health crisis, and anticipated that this would be needed for about two months, said Luciana Armijos, a researcher in emerging diseases at Pontifical Catholic University of Ecuador. "We haven't returned to normality to this day, and this is reflected in budget deficits in the Public Health Ministry," she said.

Most of the emergency funds went to cities, so deliveries of supplies to rural areas were often delayed, and some workers had to rely on private donations from local companies to cover medicines and personal protective equipment. Farfán says EARD has received reports of rural healthcare workers running out of N95 masks, rapid testing kits, and even basic medicines like paracetamol just a month or two into their placements. The government was often up to three months late in paying salaries ($760-990 per month, compared with the starting salary of around $1300 a month for a physician in a city).

Ecuador's Ministry of Public Health has seen frequent changes of leadership—including 43 health ministers in 41 years[2] (six since March 2020)—and policies have been inconsistent. Before covid, continuous cuts to public spending budgets had led to significant layoffs at the ministry.[3] Armijos told *The BMJ* that among those laid off were delegates of the National Immunization Strategy who directed distribution of various vaccines to each healthcare station in a district. Only about 30% of all districts in the country now have such personnel.

America

In the US, vaccines against covid-19 are readily available and rural public health clinics are well supplied. But they are also understaffed and under attack, fighting politically for funding, while threatened and sometimes attacked by the same public they were intended to protect.[4]

"Rural adults have consistently been among the groups most likely to express strong resistance to getting a covid-19 vaccine," are less likely to vaccinate children, and more often oppose vaccine mandates, the Kaiser Family Foundation reported in December.[5]

In November 2021, rural parts of New York state were in the midst of a severe fourth surge in covid infections that started mid summer, while New York City and nearby metropolitan areas saw only slight increases in cases, according to the state's Department of Health.[6]

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The worst hit rural counties were seeing their highest numbers to date: up to 135 new daily cases per 100 000 population—six to 14 times higher than urban counties around New York City.[7] It was nearly opposite from the early months of the pandemic, when the virus spread first in large cities, overwhelming hospitals and morgues as New York City peaked at near 100 new cases a day per 100 000 people.[8]

In December, the omicron variant hit the state and the situation reversed again, with the most extreme numbers in the metropolitan regions.[9 10]

This pattern of covid surges starting in major cities before spreading to rural areas repeated across the US. Death rates from covid have been higher in US rural areas since autumn 2020, attributed to a rural population that skews older, with higher levels of comorbidities and less access to medical care,[11] according to US government figures.[12]

Mortality from covid was twice as high for rural residents as city and suburban residents in the second half of 2021, the US Center for Rural Strategies found. "For 66 out of the last 71 weeks, rural Americans have been dying of covid-19 at higher rates than metropolitan Americans," Tim Marema reported in *The Daily Yonder*, a publication of the Center, in November. "The pandemic didn't start this way. The first wave was primarily an urban phenomenon. But in each of the ensuing three waves, the rural rate has exceeded the urban rate. And with each wave, the rural disparity has become more pronounced."[13]

Rural hospitals, with more limited facilities, lower surge flexibility, and less ability to share resources with nearby institutions than urban hospitals, reported that longstanding operational challenges worsened during the pandemic. "Hospitals described difficulty balancing the complex and resource intensive care needed for covid-19 patients with efforts to resume routine hospital care," the US Department of Health and Human Services found in a 2021 survey of 320 hospital administrators. "They reported that staffing shortages have affected patient care, and that exhaustion and trauma have taken a toll on staff's mental health."[14]

The US and Ecuador have similar numbers of doctors per person (although the US has 11 times as many nurses per capita).[15] And the imbalance of rural doctors is comparable in both countries: rural counties in the US are home to 20% of the population but only 11% of doctors, the American Association of Medical Colleges reported.[16]

Zimbabwe

At the Plumtree District Hospital in southwestern Zimbabwe, health workers have struggled to limit the spread of the disease. Plumtree is a border town 95 km from the city of Bulawayo, and is a major crossing point to Botswana and South Africa, creating a vector for infection.[17]

"Up to now we continue to receive people from across the borders, cross-border trading, border jumpers," said Joe Nganono, the Plumtree district medical director. "We can't control the disease because people just cross the border." Nganono said his hospital is dealing with limited resources and relies on donated medical equipment such as x-ray machines from diaspora Zimbabweans.

Rural studies researchers Bellita Banda Chitsamatanga and Wayne Malinga describe Zimbabwe's healthcare as a system on the brink of collapse, only surviving for the past two decades because of international aid. More than two thirds of Zimbabwe's population is rural and facilities had no spare capacity to meet demand for treatment of covid or testing, "leaving the rural vulnerable and deprived populations lack[ing] access to medical services" and leading the World Health Organization to warn of "the imminent effects of the 'silent' spread of this virus in countries such as Zimbabwe."[18]

When covid arrived, the government intervened on an emergency basis. "All public [health] institutions owned by either the central government or a local government were taken over [by the central government] for the purposes of managing the pandemic," said Edwin Sibanda, director of the Bulawayo Health Services Department. "They receive consumables, medicines, and other equipment that may be required to manage covid-19, such as temperature screening devices, sanitisers, and dispensers, and personal protective equipment for staff." However, these short term infusions of assistance could not reverse long term deficiencies.

According to the Zimbabwe Association for Doctors for Human Rights (ZADHR) the country's health sector has suffered decades of neglect because of governmental underfunding, causing consistent shortages of staffing and supplies.

Zimbabwe has 2.1 doctors for every 10 000 people, compared with Ecuador which has 22, and the US which has 26.[19] Many health workers leave the country for better opportunities. It causes skill shortages, especially in rural clinics where poor employment conditions and low wages are coupled with unreliable infrastructure.

The government has a longstanding national health goal to locate rural health centres within 10 km of all residents.[20] A 2020 study on healthcare accessibility[21] reported that 87% of respondents reported long distances they had to travel to rural healthcare facilities. With transportation either unavailable or unaffordable, 49% reported walking more than 6 km to the nearest healthcare provider, and 14% said they walked more than 10 km, and all on poorly maintained roads. The situation became more dire during the pandemic, as health workers became more reluctant to travel or work in rural districts.

What now for rural healthcare in the pandemic?

"The effects of the covid-19 pandemic on rural populations have been severe, with significant negative impacts on unemployment, overall life satisfaction, mental health, and economic outlook," wrote authors of a report published in *PNAS*.[22] The urban-centric focus of policy makers and researchers means that these issues get insufficient funding or investigation.

As concluded in a recent paper looking at Zimbabwe's situation, countries need to mobilise financial resources to make drugs available, attract and retain senior managers and professional nurses, provide the required medical equipment, and ensure health infrastructure maintenance, as well as build health facilities that are accessible to local communities. "Without funding nothing moves in healthcare," said Norman Matara from the ZADHR.

Government funding is needed for operations, equipment, and staffing, said Heidi Bond, a county public health director in rural New York, "The money slowly goes away.... Asking a rural community to use their own resources puts a strain on the already strained healthcare system."

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