



CHOLERA – GETTING THE BASICS RIGHT



Unlike this patient, cholera victims often access health care too late to save their lives.

Picture: Chris Bateman

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A raw sewage spill from Beit Bridge into the Limpopo River and a total breakdown in that Zimbabwean town's water treatment caused the worst of the recent cholera outbreaks in southern Africa. The spillage epitomised an

infrastructural breakdown in Zimbabwe that cost at least 3 037 lives and infected 65 700 people there and in South Africa over 3 months.

The respective cholera tallies between early November and 28 January this

year were: Zimbabwe – 3 000 dead plus 60 000 infected, and South Africa – 37 dead and 5 700 cases.

Zimbabwe's cholera death toll has now exceeded the number of people who have died from the disease in the entire African continent 'over several years,' according to the World Health Organization (WHO).

Zimbabwe's doctors reported their public health system in 'total collapse' and said the failure to contain the outbreak was the result of inadequate supplies of safe drinking water and dilapidated sanitation systems that often left poor communities surrounded by raw sewage.

Drug shortages, insufficient medical supplies, dilapidated infrastructure, equipment breakdowns and the brain drain had 'as good as' closed the main referral hospitals, while the Medical School of the University of Zimbabwe shut down 'indefinitely' when it became impossible to teach medical students in non-functioning health institutions.

Dr Mo Nkadimeng, Limpopo Province's health chief, told *Izindaba* that the Beit Bridge sewage spill was the largest single cause of fatalities and infections. These plummeted dramatically just weeks after South African Water Affairs teams repaired the town's decaying and neglected sewage infrastructure. Early on, an overwhelmed Beit Bridge Hospital was treating 250 new patients a day, most of whom were referred across the

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border to Musina Hospital, which by 26 January had just 2 cholera patients left. The highest number of cholera patients in any of the 4 main Limpopo hospitals then was 15.

'We have it contained but remain vigilant'

'The main source is contained. It's now all about vigilance, education and aggressive treatment of anything diarrhoeal, but we cannot stop people from travelling and they can come from afar afield as Harare or any town where similar conditions pertain,' Nkadimeng warned.

As if to illustrate this, South African Health Minister Barbara Hogan revealed that cholera was being reported from every single province in South Africa and that the South African National Defence Force had been mobilised to help out in Limpopo and Mpumalanga.

She placed health authorities nationwide on high alert, with all cases of diarrhoea being treated as cholera. The cholera outbreak affected 9 countries in the southern African region, according to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) – Angola, Botswana, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe.

'Trans-border infections have been recorded and cholera is becoming endemic (recurrent throughout the year) in most of the affected countries,' OCHA said.

All initial patients treated in South Africa were Zimbabwean, with the patient profile changing as the epidemic spread. However, in a sobering observation, Jonathan Timm, spokesperson for the Mvula Trust, South Africa's largest NGO focusing on water issues, said South African rural communities were increasingly being forced to use water contaminated with human waste. Human faeces and waste were landing up in rivers and,

because municipalities were failing to provide piped water, communities were forced to drink river water. An example of Zimbabwe-style sanitation maintenance was one Eastern Cape local government's ineptitude and inaction which led to 80 diarrhoea-related child deaths in the greater Barkly East area in April last year.

The WHO said cholera cases could balloon before the rainy season ended this March while the lack of infrastructure to combat endemic malaria was 'deeply worrying'.

A malfunctioning and decaying water reticulation and purification system in the Ukhahlamba District Municipality (Barkly East, Maclear, Sterkspruit and Elliot), reported in October last year, was only inspected 5 months after a worried Barkly East money lender, noticing soaring loan applications for infant burials, contacted an official.¹

For the latest cholera outbreak a swathe of international NGOs, with the WHO at the forefront, were early this January putting in place a comprehensive and co-ordinated regional operational response with outbreak investigation and response teams, epidemiologists, water and sanitation engineers and social mobilisation experts flying in to help.

Most alarming, according to Red Cross and Red Crescent health experts, was a Zimbabwean mortality rate of 5.7%, 5 times greater than that typical of cholera outbreaks and an indication that the outbreak was out of control. Already in December 2008 the United Nations reported cholera as having spread to all of Zimbabwe's 10 provinces and to 55 of the 62 districts (89%).

Said Tony Maryon, head of the International Federation of Red Cross and Red Crescent Societies (IFRC) team in Zimbabwe, 'Overall, we've had a 20

per cent increase in cholera deaths over the past week (19 - 23 January) and this rings alarm bells for the humanitarian effort'. 'Because of the severity, we fear that it will take many more weeks to get under control.'

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Physicians for Human Rights (PHR) said that between September and November 2008 most wards in Zimbabwe's large public hospitals gradually closed. The most abrupt halt in health care access was on 17 November, when the premier teaching and public referral hospital in Harare, Parirenyatwa Hospital, closed its doors along with the medical school. Parirenyatwa Hospital and Harare Central Hospital (also closed in November 2008) are Harare's largest. The hospital has had no running water since August 2008. Toilets were overflowing, and patients and staff had nowhere to void – soon making the hospital uninhabitable. Parirenyatwa Hospital was closed 4 months into the cholera epidemic – arguably the worst of all possible times to have shut down public hospital access. Successful cholera care, treatment, and control were 'impossible in a facility without clean water and functioning toilets,' PHR said.

KwaZulu-Natal's cholera expertise proving vital

The collateral impact resulted in South Africa's second worst cholera outbreak since the 2000/2001 summer season (171 recorded deaths and 82 275 cases) when an epidemic spread throughout the Eastern and North Eastern parts of South Africa, with KwaZulu-Natal at the epicentre. South Africa has been relatively free of cholera since 2004 (based on available data).

Nkadimeng scotched reports that all rivers flowing through the Kruger



National Park were infected with *Vibrio cholerae*, emphasising that 'only 2 - 3 kilometres of where the raw sewage had entered the Limpopo River were infected'.

'They tested 5 kilometres from the inflow site and there was no cholera. The river naturally filters it out as you go downstream,' he said.

He ruled out control measures such as the notoriously unreliable cholera vaccination or border officials demanding cholera certificates, saying the borders with Zimbabwe were 'totally porous'.

'The issue is to deal with it at source, manage the water resources. No matter how poor you are, if you can make a fire, you can manage cholera,' he added.

Dr Charles Magero, principal specialist and acting national director of communicable diseases for the South African Health Department, said his staff was collating risk assessments across all provinces, using templates of vulnerable populations created during the 2000/2001 KwaZulu-Natal outbreak.

Jagals' team was probing food as well as person-to-person transmission modes and 'what might turn on the pathogenicity in a non-pathogenic strain present in a person, population or media used by (vulnerable) populations'.

'We're using StatsSA figures and Department of Water Affairs profiles on safe water coverage across the country so we can improve our early detection capacity by identifying vulnerable populations. In KwaZulu-Natal they had a map which predicted

where cholera would pop up during an outbreak. It was unerringly accurate and really paid off,' he revealed.

Magero said he toured Beit Bridge after the recent outbreak and was not surprised 'because the risks were clearly there; you could see it at the markets, the bus terminals, there was huge congestion and hygiene issues'.

He appealed to local provincial health workers to 'look closely at your carriers to see where they come from and check for linkages', and warned that some 80% of cholera carriers remained asymptomatic and in the community.

'It's critical we remain alert,' he said, pleading to end the *Izindaba* interview so he could chair a provincial teleconference recently initiated to tighten up cholera response co-ordination.

Transmission possibilities

Paul Jagals, Professor of Environmental Health at the Tshwane University of Technology (and advisor to the Limpopo Health Department on the outbreak), said his staff was interviewing Zimbabwean patients to 'get a clearer idea what the carrier media of the disease might be over there'.

The general tendency in cases of cholera would be for task teams to find out whether the major transmission route would be the water that people drank. In the case of the Vhembe district of the Limpopo region, the local water supplies 'seemed to be free of the agent, and were only sporadically and quite randomly found in natural surface water sources that only some parts of the population would use – for the moment certainly not occurring sufficiently widespread in water in the area to singly explain the persistent

outbreaks as well as the spreading of the outbreaks'.

Many of the cases reported in the area nearer to the Limpopo River were Zimbabwean citizens who crossed the river looking for help.

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One exciting possibility was initial evidence that water that was free of pathogens at the tap ended up being pathogenic by the time it was used by the consumer. Water containers became soiled, with biofilm build-up on the inner sidewalls, with household members (not the water itself) being the origin of the infectious agent.

While this had yet to be demonstrated with cholera (as it was with diarrhoea), the potential existed.

Jagals said it was vital for communities to keep potable water potable until it was ingested.

He said it was difficult to affect behaviour change, such as hand washing, in communities that often had marginal supplies of water – but improved sanitation and how to best use it as well as domestic waste management was 'key'.

Added Jagals, 'These interventions are nothing new – the challenge is to get people to understand and apply the interventions optimally. Cholera, like most acute diarrhoea outbreaks, is a disease of poverty, not just of water.'

Chris Bateman

1. Bateman C. Incompetent maintenance/inept response – eighty more Eastern-Cape babies die. *SAMJ* 2008; 98(6): 429-430.