

REVIEW OF CHOLERA
EPIDEMIC IN SOUTH AFRICA,
WITH FOCUS ON KWAZULU –
NATAL PROVINCE

August 2000 – 11 April 2001 (8 months)

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TABLE OF CONTENTS

CONTENT

1.0	Introduction
1.1	Objectives of the review
2.0	Methodology
3.0	Overview of Cholera
3.1	Global
3.2	South Africa
4.0	Current Epidemic
4.1	Characteristics of the epidemic
4.2	Spread of the disease
4.2.1	National
4.2.2	KwaZulu-Natal
4.3	Trend of the Epidemic
4.4	Cholera Deaths
4.5	Risk Factors
4.6	Issues
5.0	Response of Health Services
5.1	National Response
5.2	Strengths of the Interventions at Provincial Level, KZN ...
6.0	Challenges
6.1	Continued reporting of high number of cases
6.2	Burden of Health Department
6.3	Slow behavioral change and low Community participation
7.0	Way Forward
7.1	Coordination of Epidemic Control
7.2	Case Management
7.3	Staff Shortage
7.4	Surveillance
7.5	Health Promotion and Education
7.6	Breaking Chain of Transmission
7.7	Poverty Alleviation

TABLES:

Table 1:	Summary table showing information on cholera in SA; 1981-1984
Table 2:	Cholera in South Africa August 2000-11 April, 2001
Table 3:	Characteristics of Cholera deaths in KZN

FIGURES

Graph 1:	Line listing-Age Distribution of Cholera Cases
Epidemic Curve 1:	Weekly distribution of Cholera Cases in KwaZulu-Natal 30 th Oct-8 th April '01
Epidemic Curve 2:	Weekly distribution of Cholera Cases in most affected Districts

Review of Cholera Epidemic in South Africa, with focus on KZN Province, August 2000 – 11th April 2001 (8 months)

1.0 Introduction:

During 2000/2001 a cholera epidemic spread through the Eastern and North Eastern parts of South Africa. The first case confirmed in KwaZulu Natal on 14th August, 2000 and is the most affected Province. *Vibrio Cholerae* El Tor Ogawa was isolated and by 5th April the epidemic had brought about 82,275 cases to cholera treatment centres (hospitals, clinics and Rehydration Centres) and caused 171 deaths. In addition to the suffering and loss of life, the epidemic has cost the Communities a lot of resources on treatment of cholera patients (unit cost to be worked out), significant productive work time loss and other social economic costs.

Response has been organized through set up of coordination structure; inter-ministerial committee, National Task force on Cholera, Joint operations Committees (JOCs) at Provincial, Regional and District levels with Technical Support from WHO.

A review was conducted in April 2001 as part of the ongoing cholera control activities

1.1 Objectives of the Review:

- To review status of the cholera epidemic and trend to form basis for discussion with National and Provincial DOH.
- To find out what progress has been made against the Task force Objectives.
- To find out what problems and constraints the Task force has experienced during period of implementation.
- To make some recommendations for the province and country on how to strengthen on going interventions and for the future.

2.0 METHODOLOGY:

Information was gathered on aspects of: case management, surveillance, water and sanitation, IEC and Social mobilization, logistics and supplies as well as coordination of activities, through;

- Briefing from some members of Provincial DOH Task force on current epidemic and ongoing control activities.
- Proceedings of Provincial JOC meetings including review of minutes of meetings.
- Review of reports (water and sanitation); cholera control guidelines prepared by Province.
- Cholera daily updates, papers on previous epidemics in South Africa, and WHO technical support reports (Oct.00 & Jan.01)
- Field visits to the most affected districts, Ulundi attended JOC meeting, visit to CTCs in Nkonjeni, Benedictine and Itshejuba hospitals, Ncotshane clinic, Rehydration Centres (Mfemfe and Emphapheni) as well as Communities/villages in hard hit areas to get a clearer picture of the sanitation and water situation at grass roots level.
- Met and held discussions with key informants particularly those who are members of the Regional/district JOC levels.

3. OVERVIEW OF CHOLERA

3.1.Global:

The 7th Cholera Pandemic, which began in 1961 in Celebes, Indonesia, spread to Bangladesh in 1963 and the following year reached India. The 3rd stage (geochronological period) covered countries in the Middle East (Iran & Iraq during 1965/6), West Africa in 1970 and Latin America in 1991.

The causative type was *Vibrio Cholerae* 01 biotype El Tor. Within two years it had spread to 30 of the 46 countries in Africa and by 1990 accounted for 90% of all cases reported by WHO.

In 1995 WHO estimated that some 20,000 deaths were caused annually with many more people suffering with the disease. Case Fatality Rate (CFR) has generally been higher in Africa than elsewhere (Regional average of 5.7%, 1998 WHO Weekly Epidemiological Report)

3.2.South Africa (SA)

As early as 1971, SA was considered at risk (H.G.V. Kunster, G. Du Plessis, 1980 – 1987)

The hot humid summer seaports, overcrowded communities, with low standard of environmental sanitation and scanty, restricted and unprotected water supplies in some areas facilitated introduction of cholera in SA.

- 1973 first case of cholera diagnosed in SA.
- 1974 (March) 2 Eastern Transvaal coal mines and 1 gold mine yielded cholera positive sewer pads.
- 1974 (25th March) sewer of Western Transvaal gold mine also became positive. 2 healthy cholera carriers found (rectal swab survey)
- 1978 confirmed 3 cases in SA tourists (imported)
- 1980 (Oct. 2nd) first case diagnosed in open community at Shongwe hospital in KaNgwane.
Characteristics of cases – lived on farms at Malelane and had drunk water from Crocodile – Malelane irrigation canal.
- Oct. '80 – July. '87: 25,251 positive cases identified near border with Mozambique

Characteristics:

- More than 99% of cases occurred in areas with an annual rainfall of >600 mm.
- Peaks towards end and early months of New Year.
- There were no major outbreaks reported from areas of similar socio-economic status in dry arid regions of the country.
- The last 3 bacteriological proven cases of cholera were reported in November. 86 from Eshowe and Greytown in Natal.
- 1983: Outbreak in KZN (not documented)
- 1988: 3 cases confirmed in KZN
- 2000/2001 – ongoing, see Section 2.

Table 1:

Summary table showing information on cholera in S.A., 1981 – 1984.
(Source, SA National Dept. of Health)

	30/09/80 – 31/07/81	1/08/81 – 5/08/82	6/08/82 – 31/07/83	1/08/83 – 27/07/84
Confirmed	3786	11141	7638	1977
Estimated Suspected Treated	30,000	50,000	20,000	5434
Reported Deaths	42	218	62	20
CFR (%) On proven Cases	1.1	2.0	0.8	1.0

4.0 CURRENT EPIDEMIC:

The country has been experiencing an outbreak of cholera since early August when it was first reported in KwaZulu Natal.

4.1. *Characteristics of the epidemic;*

- Causative organism: *Vibrio cholerae* 01 type El tor Ogawa; which produces many asymptomatic carriers (75%) , and those infected shed millions of vibrios in stools for longer periods (about 2 weeks)
- Sensitive to ; Nalidixic acid & Ciprofloxacin and resistant to the usual drugs Tetracycline, Erythromycin
- Attack rate: 2234/100000 population (early April 2001)
- Case Fatality Rate (CFR): 0.21% National and KZN Province implying very good case management. The recommended, given good preparedness and implementation of control strategies is <1% (WHO, cholera control guidelines).
- Susceptibility: Female higher risk (about 60% of reported cases) and age groups 11-20 & 21-30.
- Due to the high level of labour immigration practices of male adults, females constitute the biggest proportion of the population in the communities affected. The age distribution curve is skewed to the left, younger age groups more represented, typical of endemic scenario, adults having substantial immunity from previous infections. ***(Graph 1)**
- Majority of the patients are Black people, mostly living in places with poor sanitation and poor living conditions. Households with good living conditions (i.e. well built homes, have toilets, source of clean water) and educated members were not affected.

**(Graph 1 – “Line Listing –Age Distribution” see attached)*

4.2. Spread of the disease:

4.2.1. National:

As of 2nd April 2001, eight of the 9 Provinces have been affected: cumulative total 81,265 cases with 182 cases giving a CFR of 0.22%. Table 2 shows distribution of cases and deaths in the country, KZN being the most affected. Despite the high attack rate 2234/100000 (KZN, April 2001) the CFR remains low at 0.22%. This implies good case management on part of the health workers in affected areas.

Table 2:
Cholera in South Africa, 16th August, '00 – 5th April, '01

Province	Date	Cases	Deaths	CFR
Natal	01/04/01	80,387	168	0.2%
N.Province	02/04/01	741	9	1.21%
Mpumalanga	21/03/01	79	2	2.53%
Gauteng	29/03/01	49	3	6.12%
North West	12/03/01	6	0	0.0%
E.Cape	26/03/01	1	0	0.0%
Free State	26/03/01	1	0	0.0%
W.Cape	02/04/01	1	0	0.0%
N.Cape	26/03/01	0	0	0.0%
Cumm. Total		81,265	182	0.22%

4.2.2. KwaZulu Natal:

The index case was reported in the Lower Umfolozi/Hlabisa district on 14th August in areas of Nqutshini and Ngqolothi. Patient had attended funeral the previous week. The disease spread to other districts in the province; Eshowe/Nkandla mid-September, Stanger and Port Shepstone on October 11 & 13 respectively. There was no clear link between the different index cases from the different districts despite the important population movement in the province. Cases have subsequently been reported in all 10 districts and health regions accounting for over 90% of all cholera cases reported Nationally.

Table 3 shows distribution of cases & Deaths in the Province.

Spread of Cholera cases in KwaZulu – Natal Province, August 10th 2000 – April 5th 2001.

	Cumm.Cases	Total Deaths	CFR (%)
Lower Umfolozi	18.436	22	0.12
Eshowe	24.575	29	0.12
Durban	1.138	15	1.32
Stanger	6.566	14	0.21
Port Shepstone	8.032	19	0.24
PMB Ndlovu	3.797	17	0.45
Ladysmith	231	1	0.43
Newcastle	937	10	1.07
Ulundi	18.414	37	0.20
Jozini	153	7	4.58
Total	82.275	171	0.21

4.3. Trend of Epidemic:

Following a slow rise in number of cases (Mid November – 10th December 2000) there was a steady increase, reaching a peak week ending 11th February 2001.

With exception of observed increase during week ending 18th March (corresponding to a-rise in Ulundi district) the epidemic has since been on a decline. The trend of cases in districts of Ulundi, Eshowe/Nkandla, Lower Umfolozi roughly resembles pattern in total figures for KZN, these districts contribute to bulk of cases reported in KZN.

(See epidemic curves 1 & 2)

4.4. Cholera Deaths:

Information was gathered from standardized forms that had earlier been filled by hospitals indicating the immediate cause of death. Data on 128 out of a total of 134 forms returned to the Epidemiology Unit was analyzed. Findings are shown below in **Table 3*. It's possible some of these deaths could have been prevented through strengthened interventions especially related to care (either at home / treatment centre) and community awareness through appropriate care seeking practices. Empowered traditional healers would be strong advocates for early initiation of rehydration process (using SSS/ORS) and making appropriate referrals.

** Epidemic curve 1 & 2 – See attached to document.*

4.5. Risk factors:

- Use of contaminated water especially in rural areas. A number of environmental surveys carried out showed that rivers were infected by vibrio cholerae.
- Clean water collected in dirty containers and not often covered.
- Very low latrine coverage (estimated 20–40 %) in affected areas. Some homes had poor structures and holes not often covered, posing risk for further spread of the disease.
- Gatherings (e.g. funerals and other festivities)
- Poor personal and domestic hygiene (e.g. hand washing especially after use of toilets and before eating, food hygiene and clean environment)

4.6. Issues:

- Following a period of no cholera in the Province, an outbreak is reported without any clear linkage of index case to neighbouring countries (some of which had been reporting cases) or travel to affected areas. This raises important questions. Where did the bacteria come from? Given the previous history of cholera in the country especially KZN, could it be related to;
 - Persistence of long term carriers?
 - Persistence of organisms in free-living, altered or adapted forms capable of reverting to a pathogenic variety?
 - Continuous year round transmission by sub-clinical cases? Systematic rectal exams done shows a high level of vibrio carriers in the population indicative of the fact that the epidemic has been going on for sometime. The skew to the left observed in the age distribution curve is characteristic of endemic situation
- Cholera contained in other provinces but persists in KZN. Are there strategies/lessons that could be learnt from those provinces that have also been previously affected?

5.0. RESPONSE OF HEALTH SERVICES:

Since confirmation of the disease outbreak in August 2000, response was organized through setting up coordination structures.

5.1. National Response:

- Co-ordinations; structure for coordination of activities for epidemic control are in place;
 - Interministerial meetings (Committee) held meetings in Durban and Cape Town.
 - National cholera task force in place.
 - Provincial task force – chaired by Superintendent General.
 - Regional JOCs/District JOCs.
 - Sub-district JOCs

These structures initially met on a daily basis – now reduced to twice a week, to monitor trends of the epidemic, needs assessment and implementation of field operations.

- Guidelines (WHO Treatment guidelines); are used in case management. However not available in some cholera treatment centres e.g. in Ulundi district, surveillance (the National line listing format is used), reporting (cases reported on a daily basis and general Public

informed through regular press releases made by Provincial health authorities, HP&E materials.

- No ineffective control measures e.g., quarantine, use of vaccines & prophylactic treatment.
- Risk factors and people at risk identified.
- Capacity building:
 - Epidemic preparedness and Response (EPR) workshop for at risk provinces (for provincial CDCs)
 - Workshops for GPs, Nurses, Microbiology students and laboratory technicians.
 - Epidemiologist for KZN and at national level.
 - Deployment of health personnel to and from other provinces to KZN
 - Community health Registrar supporting National level CDC.

Communication established:

- A comprehensive network has been established with;
 - Provinces
 - SADC member states
 - Media (National & international)
- National strategy/business plan on cholera together with Department of Water Affairs, Forestry, Traditional and Local governments.
- Joint (National, KZN – DOH & WHO) evaluation of the epidemic carried out in October 2000 and January 2001.
- Confirmed cholera outbreak in other Provinces.
- Social mobilization
 - Video on cholera in different languages
 - Health education materials produced and distributed to the Provinces.
 - Institutions (Schools ...) sensitized.

5.2. Strengths of the Interventions at Provincial level, KZN:

- Coordination:

Joint operational Committees (JOCs) at Provincial, Regional and District – functional and hold regular meetings with representation from other sectors, water and sanitation, SAMHS, coordinating epidemic control activities. However, Ulundi JOC hadn't met for 2 consecutive weeks.
- Case management:
 - Very low case fatality rate (CFR) 0.21%, signifying good case management in spite of the high incidence rate of cases. However, there is need to strengthen use of provincial cholera management guidelines. This would further improve on case management, not only a very low CFR but ensure rational selection of treatment, timely rehydration especially severe dehydration (6 hours in younger children and 3 hours in older and adults) under close supervision, minimize complications and unnecessary overstay in hospital/treatment centres.
 - Rehydration centres treating more patients than hospitals (Ulundi). These were put in areas where the greater number of patients was recorded. Suspects are referred to hospitals by ambulances.

- Logistics and Supplies
 - All supplies for treatment (ORS, IV fluids, soap, gloves exam / home and chlorine were available). Protective wear (plastic aprons, plastic cover shoes/gum-boots) were missing in some of the cholera treatment centres.
 - Additional transport to boost health education and sanitation promotion, patient referrals and transportation of laboratory specimen in all affected districts has been provided.
 - Production and distribution of cholera control guidelines supplied to cholera treatment centres.
- Funding; adequate (Provincial funds and releases from National level) to handle the epidemic.
- Surveillance;
 - Database functional including GIS to track the trends of infection in the affected areas in place. Daily surveillance system for cholera operational, reports received from the districts. Daily reports and media releases produced.
- Committed Staff; Additional staff have been recruited on temporary basis to support in disease surveillance and case management, working even during holidays and extra hours on normal working days. Most of the treatment centres operate on 24-hour basis.
- Water and sanitation;
 - Measures in place include; Provision of treated safe water in tankers to affected communities. In affected areas environmental measures e.g. provision of latrines (at public gathering places), promotion of safe refuse disposal, food handling practices and chlorine concentrates (Jik) for water purification in the homes. These are on immediate to short-term basis. Other measures on medium – long term basis are (ensuring routine provision of safe water supplies and improved sanitation) under consideration. However because of the shortage of staff there is inadequate monitoring of interventions.
- Health Promotion & Education:
 - Health education programmes (through media, pamphlets, drama) to raise and ensure sustained community awareness to the importance of safe water and its relationship to health. Emphasis has been placed on use of safe water sources, storage, hygienic handling of food and proper sanitation measures (personal and environmental)

6.0. CHALLENGES:

Its about 9 months now since the epidemic broke out and control efforts are ongoing. Some challenges include;

- 6.1. Continued reporting of high number of cases (daily average 280-300) in spite of high-level interventions i.e.;
 - Availability and accessibility of water & sanitation services.
 - Use of guidelines, Provincial cholera treatment guidelines have been prepared but still lacking in some treatment centres.
 - Implementation of preventative measures (education on personal and domestic hygiene, use of boiled water/treated water for drinking, providing Jik and providing water by tankers and tanks), provision of latrines (e.g. Judea church gatherings and rehydration centres)
- 6.2. Burden on Health Department

Both the National and Provincial strategic plans indicate multisectoral approach to cholera epidemic control. However, there are some deviations;

- Lack of active participation by other public sectors despite repeated notification (e.g. education)
- Absence of cholera epidemic control work plan at some levels, resulting in DOH taking up more roles than they should have.
- Shortage of staff (Health, Environmental health especially at lower levels). A cadre below EHO (e.g. Health Assistants) would closely follow up implementation of intervention measures in the Communities and identify areas and homes at high risk.
- Lack of operation along standard treatment guidelines resulting in over diagnosis and over reporting of cases and overstay in hospitals/treatment centres.
- Uncoordinated health promotion and education of different programs' related components at implementation (Community) level.

6.3. Slow behavioral change and low community participation;

- Cultural beliefs and practices (e.g. direct use of water from streams/rivers; cant use same toilet with father-in-law)
- Knowledge and attitude
- Inadequate active participation by communities – no clear coordination or organizational structure at community level especially active participation in promotion of sanitation (i.e. mobilization and supervision)
- Accessibility of most affected rural areas to the services;
 - ◆ Tankers not reaching to remote areas.

7.0. WAY FORWARD

7.1. Coordination of epidemic control;

- Strengthen interministerial committee and review roles and linkages of different sectors involved in epidemic control.
- Involvement of all potential role players including community leaders, NGOs, Local organizations, Traditional healers etc. at District and Sub-district levels.
- Strengthen operations of the JOCs through; clarification of roles, drawing terms of reference for sub-committees operational within the JOC. Proposed sub Committees; Surveillance & Informatics; Case management; IEC/Community outreach; Water and Sanitation; Logistics and Supplies. The Sub-Committees may meet more frequently but the JOC at least twice a week. The Sub Committee heads would report in the JOC meetings.
- Rapid assessment of water and sanitation status in institutions (schools and farms); and ensure conformity to minimum standard guidelines.

7.2. Case Management

- Ensure availability and utilization of standard treatment guidelines at all CTCs
- Strengthen HP&E and social mobilization on risk factors and cholera prevention.
- Strengthen Epidemic Preparedness and Response(EPR) in other provinces (diarrhoeal disease surveillance, avail standard treatment guidelines, ensure availability of cholera buffer stocks and active participation in promotion of safe water use and sanitation)

- Strengthen infection control procedures at all CTCs.
- Follow up of cases at home after discharge to monitor implementation of preventive measures and carry out contact case tracing in the household and immediate neighbourhood.
- Empower traditional healers to manage and refer cases.
- Increase accessibility of ORS at all treatment Centres
- Training of staff as an ongoing process to strengthen this intervention in affected areas and build capacity for EPR in cholera free areas.

7.3. Staff shortage

- Collaboration between provinces to address issue of staff shortage on a short – medium term is highly commended and should continue.
- Strengthen environmental health services for Environmental monitoring, HE&P, Surveillance (through recruitment of more Environmental Health Officers (EHO)/ Health assistants at community level to work closely with community Local leaders under the guidance of EHO)

7.4. Surveillance

- Use case definition for reporting (other diarrhoea should be reported separately)
- Laboratory confirmation for new sites, monitoring serotype, drugs sensitivity and environmental monitoring.
- Strengthen Data management (analysis and use at all levels including feedback from Treatment Centres to the Community routinely.

Community based disease surveillance; opportunity exists for its development to capture data from Community that could be integrated with in district

7.5. Health Promotion and Education

- There should be comprehensive health education program for all health-related issues at district level.
- Strengthen health education messages on cholera including emphasis on home management (increased fluid in take in particular SSS/pre-packed ORS) and early care seeking at Rehydration Centres, clinics or hospitals.

7.6. Breaking chain of transmission

- Active involvement of communities.
- Use of safe water & promote sanitation programmes in institutions (school, farms etc.)
- Ban on sale of cold foodstuff especially in places not meeting the minimum sanitation requirements.
- Strengthen implementation of immediate – short term strategies that address water and sanitation needs; in addition to rehabilitation of existing water sources, provision of emergency water supply; train community volunteers to carry out water chlorination (in water collection containers) at water collection points of commonly utilized rivers and streams in affected and prone areas. This could be piloted in one area.

- Intensify Health education and promotion interventions in all the communities and early care seeking practices.
- 7.7. **Operational research**, to establish the risk factors for persistent cholera outbreaks in order to design appropriate interventions to prevent and control cholera in KwaZulu-Natal.
- 7.8. **Poverty alleviation:**
Implementation of the broad strategies and policies that have been adopted by government.