Global deployment of Oral Cholera Vaccine (OCV)

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Stockpiling for OCV

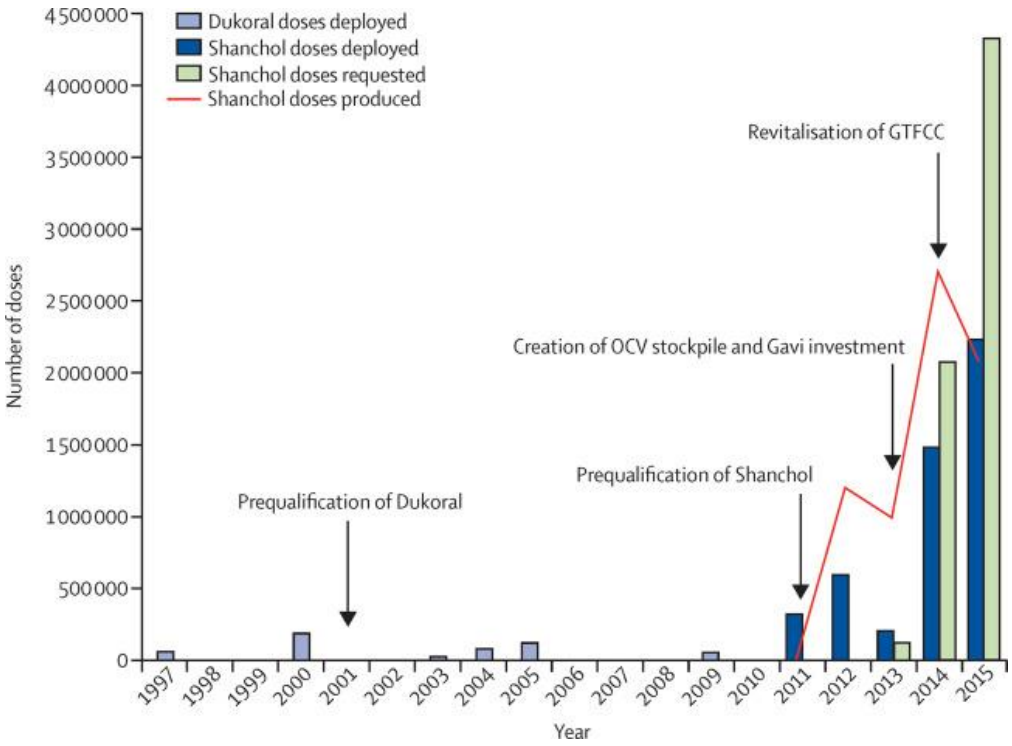
- Global stockpile of oral cholera vaccine (OCV) –
  - created since 2013 as additional tool to help control cholera epidemics.
  - between July 2013 & June 2014, two million doses of vaccine available from the stockpile.
- The OCV stockpile managed as rotating fund by International Coordinating Group (ICG) comprised of four decision making partners:
  - International Federation of Red Cross and Red Crescent Societies (IFRC)
  - Médecins Sans Frontières (MSF),
  - United Nations Children's Fund (UNICEF) and
  - WHO, which also serves as the Secretariat.

GAVI involvement

- In 2013 Gavi Board approved support for the OCV stockpile as part of the Vaccine Investment Strategy:
- With contribution of US$ 110 million for the period 2014-2018
- To increase access to OCV during emergencies and in countries that regularly experience cholera outbreaks.
- The first Gavi-supported campaign using the global stockpile began in August 2015 in Cameroon.

OCV utilisation

- Pre 2013:
  - 15 years
  - 13 campaigns
  - 1.5 million vaccinated
- Post 2013:
  - 3 years
  - 35 campaigns
  - 7 million doses delivered
  - 4 million people vaccinated
  - 13 countries



Achievements and challenges for the use of killed oral cholera vaccines in the global stockpile era.
Desai SN, Pezzoli L, Alberti KP, Martin S, Costa A, Perea W, Legros D. Hum Vaccin Immunother. 2016 Nov

GLOBAL OCV STOCKPILE IN 2016

EMERGENCY USE

- Crisis situations

– In settings where the risk of cholera is estimated to be high, to prevent the risk of occurrence of outbreak / reduce its impact

- Outbreak response

– To prevent further spread / reduce extent of outbreaks

EMERGENCY STOCK **2M doses (Shanchol)**

Includes at least 1m doses locked for emergency use (outbreaks and humanitarian crises)

- AT ALL TIMES
- Decisions from the ICG - Within 2 working days

GLOBAL OCV STOCKPILE IN 2016 contd…

NON-EMERGENCY USE

- Endemic settings

To help control endemic cholera in “hotspots” in conjunction with mid-to long-term WaSH measures

NON EMERGENCY RESERVE

- **TOTAL 4.3M doses (1M Shanchol + 3.3M Euvichol)**
- Decisions from the GTFCC OCV WG - Within 2 weeks

Flexibility around the remaining available doses for use as needed in emergency and/or non-emergency settings

Countries using OCV

Year	Type of Campaign	Number	Countries
2013	Endemic	2	Haiti (2)
2014	Endemic	10	DRC, Guinea, Haiti (8)
	Humanitarian Crisis	7	South Sudan (6), Ethiopia
2015	Outbreak	4	Malawi, South Sudan (Juba and Torit), Iraq, Nepal
	Humanitarian crisis	6	South Sudan (3), Tanzania, Cameroon, Malawi
2016	Endemic	1	Haiti
	Humanitarian crisis	3	Niger, South Sudan (2)
	Outbreak	2	Malawi, Zambia
July 2013 - July 2016		**35**	

The largest campaigns:

South Sudan (2015, Juba and Torit) 639,466 targeted (one dose)

Zambia (2016, Lusaka) 543,755 (largest campaign in urban setting).

Strategies for Vaccination

- Vaccination campaigns conducted with 2 doses
- South Sudan and Zambia piloted single dose strategy for outbreak response

- Mostly used Shanchol
- Euvichol in Malawi and Haiti (2016).

No & percentage of OCV Campaigns by type (2013–July 2016)

Type of Campaign	No of Campaigns	Percentage
Non-Emergency		
Endemic	14	37%
Emergency		
Humanitarian Crisis	16	46%
Outbreak	9	17%
Total	35	100%

Proportion of OCV doses deployed by year (2013–July 2016)

Year	No of doses	Percentage
(from July) 2013	204,500	4%
2014	1,421,880	30%
2015	2,042,775	43%
2016 (until July)	1,065,785	23%

Coverage

	1 dose	2 doses
Endemic	***96.7%***	***68.4%***
Outbreak	***89%***	***78.6%***
Humanitarian crisis	***95%***	***88.5%***
All campaigns	**94.2%**	**78.6%**

Non-vaccination

Main reasons

- Absenteeism
- Conflict with work during the vaccination hours
- Lack of information of vaccination campaign

Challenges

- Risk of people coming from neighboring areas
- Movement of displaced populations
- Difficulty in calculating population denominators
- Stock outs of supplies (vaccines, cold chain requirements etc)
- Security constraints
- Difficult access due to terrain or weather conditions.

Adverse Events Following Immunization

- AEFIs are being monitored either passively or as part of post-vaccination surveys.
- 4% - 8% experienced AEFI
- Mild and mostly due to gastrointestinal symptoms (i.e. nausea, diarrhea, etc.)

Vaccination cost

The major categories:

- cost of vaccine
- cost of international shipment
- cost of delivery (costs from all activities starting from deployment of vaccine at central level to the site of the vaccination campaign)
- technical support (includes AEFI management, vaccine coverage surveys).

The main driver is the cost of vaccine followed by the cost of delivery

It has been observed:

- cost per dose administered: **US$2.85**
- cost per fully immunized person: **US$5.70.**

Single Dose strategy

- **As outbreak response**: 2 single dose campaigns (South Sudan 2015 and Zambia 2016).

- The idea was to protect the **maximum number** in **shortest time period** given the **limited vaccine supply** in stockpile.

- Results show that vaccinating twice the number of people with a single dose can prevent more cases and deaths during an outbreak by rapid herd protection compared to vaccinating less people with the standard 2 dose strategy.

Novel strategies for hard to reach populations

Vaccination campaign in Malawi, 2016 at Lake Chilwa

- The population living in the coastal part of the lake
  - Standard 2-dose distribution at fixed sites
- Those living in the islands
  - Received their vaccine under medical supervision but 2nd dose was administered under direct observation of community leaders.
- Those living in floating homes
  - 2nd dose given to the fishermen and they were instructed to take it at home after 2 weeks (self-administration and out of cold chain)

Novel delivery strategies
OCV delivery with other interventions

In the context of pre-emptive vaccination in humanitarian crisis situation

OCV campaign in the refugee camps in Cameroon in 2015

- Held in conjunction with an anti-tetanus vaccination.
- Plus a component of screening for malnutrition.

Novel delivery strategies Used out of cold chain during distribution

- Vaccines should be maintained under cold chain (2-8ºC) for the entire shelf-life

- Evidence supports that killed whole cell vaccines are stable at high temperature for long periods

  (6 months at 42 ºC (Ahmed ZU et al. Microbiol Immunol. 1994; (11):837-42)

  (14 days at 42 ºC (Saha A et al. Vaccine. 2016;34(13):1551-8)

- Vaccine kept under cold chain in central stock, but used out of the cold chain during distribution
  - **Example**: Guinea 2012
  - effectiveness evaluation showed high protection despite the heat exposure.

Recent vaccine use since July 2016

- **Sudan**
  - 2 doses
  - August 2016
  - 200,000 doses
- **Mozambique:**
  - 2 doses
  - October/November 2016
  - 400,000 doses
- **DRC**
  - 2 doses
  - October/November 2016
  - 800,000 doses
- **Haiti**
  - 1 dose
  - November/December 2016
  - 1 M doses
- **Malawi**
  - 2 doses
  - November/December 2016
  - 200,000 Doses
- **Zambia**
  - 2nd dose
  - December 2016
  - 400,000 doses

Conclusion

- This review shows the success and feasibility of conducting OCV campaign in a variety of scenarios.
- The dynamics created by the establishment stockpile has clearly played a role in increased use of OCV
- **Further work should go into:**
  - Demonstrating vaccine impact in different settings
  - Improving timeliness of response
  - Documenting and improving delivery costs
  - Defining innovative and effective strategies for OCV delivery in different contexts.
  - prepare a calendar for OCV demand for next 2 years to communicate to manufacturers

Thank you

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