



# ***Shigella dysenteriae* serotype 1 in West Africa: Intervention strategy for an outbreak in Sierra Leone 1999-2000**

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# Bacillary dysentery

- Major cause of morbidity and mortality in developing countries:
  - *Shigella dysenteriae* type 1 (Sd1)
- 1980 and 1990s:
  - Large outbreaks in Central and Southern Africa
  - Increased antibiotic resistance
- Without treatment: mortality of 5 to 15 %

# Objectives

- **To describe the outbreak**
  - **To evaluate the outcome of ciprofloxacin treatment**
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# Methods: Outbreak investigation

## ▪ Case definition:

- Southern part of Kenema district
- Bloody diarrhoea observed by health workers
- December 1999 - March 2000

## ▪ Field laboratory in Kenema hospital

## ▪ Descriptive analysis

- Attack rate
- Case fatality ratio (CFR) in general pop. / isolation centres



# Methods: Evaluation of treatment

- Patients at high risk of death from dysentery
  - Age <5 or >50 years
  - Malnourished older children and adults
  - Severe cases: Dehydration, fever > 38.5 °C, convulsion or coma
    - Isolation centres
    - 5 day oral treatment: ciprofloxacin
- Other patients
  - Hygiene advice
  - Oral rehydration

# Results

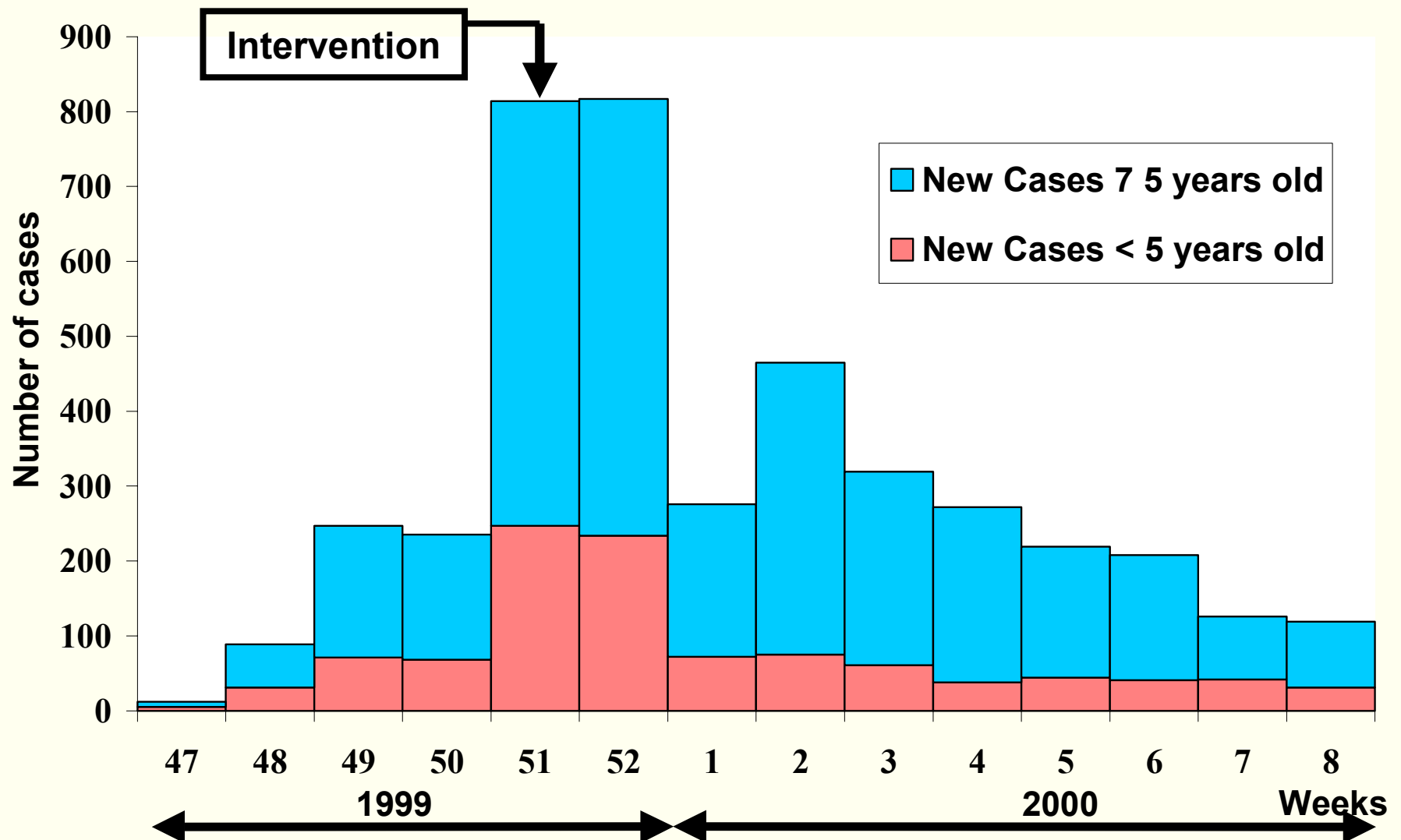


- **From Dec 1999 to March 2000**
  - **4,218 new cases of bloody diarrhoea**
  - **131 deaths**

	<b>Total</b>	<b>&lt; 5 years</b>	<b>≥ 5 years</b>	<b>p</b>
<b>Attack rate</b>	<b>7.5 %</b>	<b>11.2 %</b>	<b>6.8 %</b>	<b>&lt; 0.001</b>
<b>CFR</b>	<b>3.1 %</b>	<b>6.1 %</b>	<b>2.1 %</b>	<b>0.001</b>



# Cases of bloody diarrhoea reported per week, Sierra Leone, 1999-2000



# *In vitro* sensitivity of SD1

IP  
Paris  
(n=11)

MSF  
Kenema  
(n=29)

WHO  
Freetown  
(n=86)

Amoxicillin

Amoxi + clavulanic ac.

Tetracycline

Chloramphenicol

Cotrimoxazole

Nalidixic acid

Ciprofloxacin / Ofloxacin

Ceftriaxone / Cefixim

**R**

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# Isolation centres



- **583 patients treated**
- **CFR: 0.9 % (5 deaths)**
- **Median length of symptoms before hospitalisation: 3 days**
- **Treatment compliance cipro 5 days: 99.7 %**

# Discussion



- **First large outbreak caused by Sd1 reported in West Africa**
- **Active screening of cases in villages:**
  - Quick access to treatment
- **Low case fatality**
  - 5 day ciprofloxacin regimen: highly effective
  - Hygiene advice



# Therapeutic choice: ciprofloxacin

- **Drawbacks of nalidixic acid**
  - **Poor compliance to treatment: 4 times a day, side effects**
  - **Less effective than ciprofloxacin**
  - **Increased resistance to NA:  
From 36% to 66% in 4 months**
  - **First step to resistance to 2<sup>nd</sup> generation quinolones**



# Perspectives

- **Reconsider recommendations**
  - **Treatment protocol in outbreak situation**
- **Cost and availability of antibiotics**
  - **Access to generics of ciprofloxacin**
  - **Negotiated prices of ciprofloxacin**
- **Operational research:**
  - **Shorter therapeutic protocols**
  - **Vaccines**

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**Sd1 resistance pattern to antibiotics  
Evolution resistance strains rate to  
cotrimoxazole and nalidixic acid  
Benaco camp, Tanzania, 1994**

<b>Antibiotic</b>	<b>July</b>	<b>October</b>	<b>November</b>
<b>n</b>	<b>42</b>	<b>31</b>	<b>30</b>
<b>Cotrimo</b>	<b>57%</b>	<b>78%</b>	<b>89%</b>
<b>Nalidixic Ac.</b>	<b>36%</b>	<b>47%</b>	<b>66%</b>



## **SD1 strains resistance pattern to antibiotics East and Central Africa 1994 ñ Sierra Leone 2000**

	<b>Countries</b>	<b>n</b>	<b>Ampi</b>	<b>Cotrim</b>	<b>Nalid. Ac.</b>	<b>Cipro</b>
<b>1994</b>	Tanzania	30	100%	89%	<b>66%</b>	<b>0%</b>
	Rwanda	40	100%	100%	<b>97%</b>	<b>0%</b>
		44	ND	97%	<b>91%</b>	<b>0%</b>
	DRC	82	98%	100%	<b>98%</b>	<b>0%</b>
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<b>2000</b>	Sierra Leone	126	100%	100%	<b>0%</b>	<b>0%</b>