

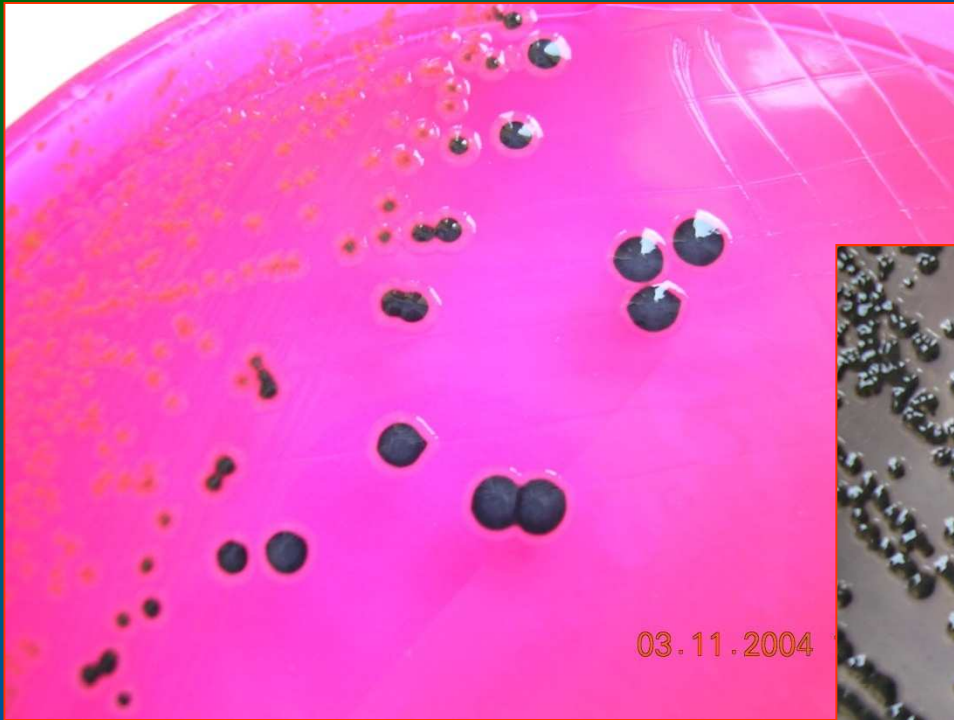
Diarrhoeal Outbreaks, Outbreak Response & Preparation for 2010

*Test & Measurement Conference September
2009*

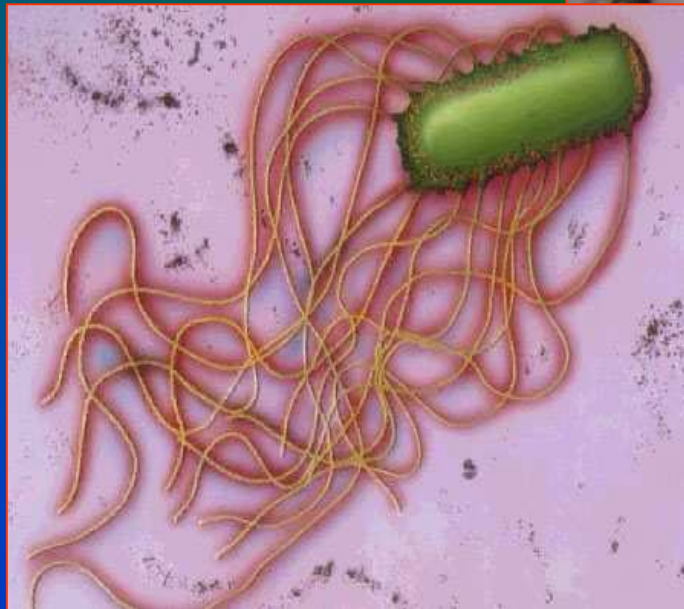
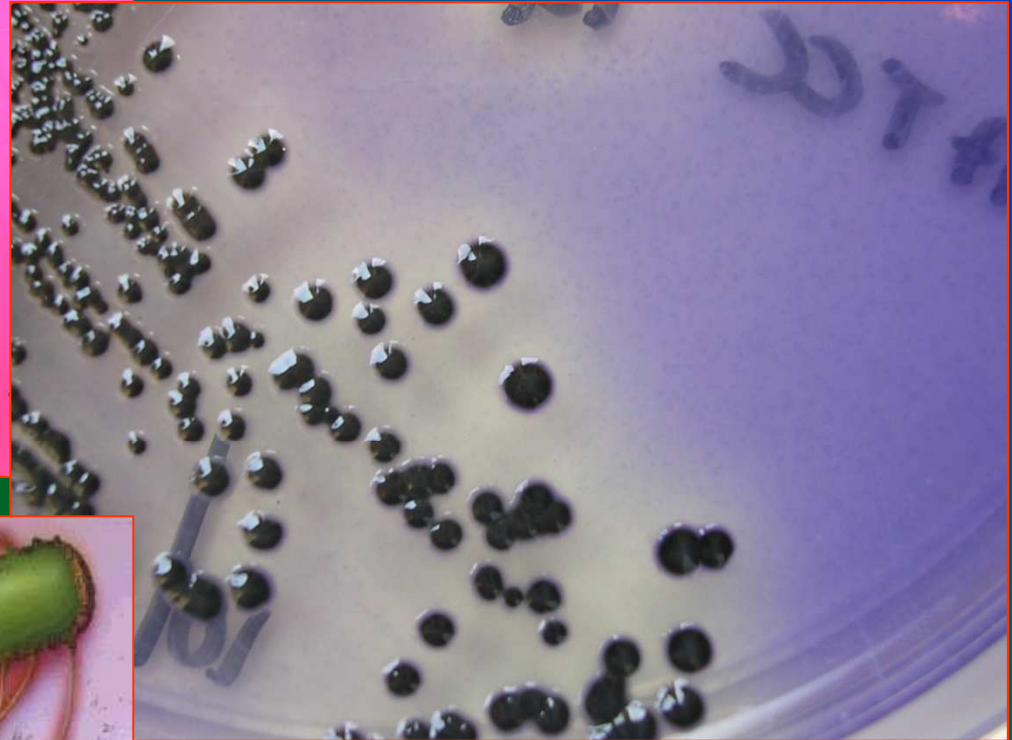
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Introduction

- **There are more than 250 causes of food borne disease.**
- **These may be bacteria, parasites, viruses, toxins or chemicals.**
- **The global incidence is unknown but in 2000 it was reported that 2.1 million died from diarrhoeal diseases worldwide.**
- **The WHO estimates that food borne diseases are probably about 350X more frequent than what is reported.**
- **The true incidence in Africa is unknown due to poor surveillance and reporting**



03.11.2004



A. THREATS RELATED TO DIARRHOEAL OUTBREAKS:

- 1. Local Factors**
- 2. Globalisation**

Types of Diarrhoeal Disease Threats

- **Threats from local factors**
 - Rural areas: clean water (washing hands & food in polluted water)
 - Potential for massive Outbreaks = Cholera (12700c/65d), Delmas
 - Cities: food vendors
 - Informal housing areas: Food choices driven by poverty
 - Dead Horse Outbreak
 - Food manufacturing industry
 - Potential for massive outbreaks & massive recalls of products

Polluted water sources resulted in the spread of the Cholera outbreak



Photos by Dr Lucille Blumberg
NICD

Salmonella in Rooibos tea

- Salmonella cultured from product in Australia
- From November 1984 – August 1985, 155 isolates of Salmonella were sent to Onderstepoort for identification. 49 different sero-groups were identified.
- The source of contamination thought to be either contaminated water, fertilizer or lizards / all.
- To protect the export industry pasteurization and laboratory testing of each batch was instituted.
- No Human cases reported in SA or Australia



USA

USA = probably one of the best models in the world in relation to food outbreak identification and response

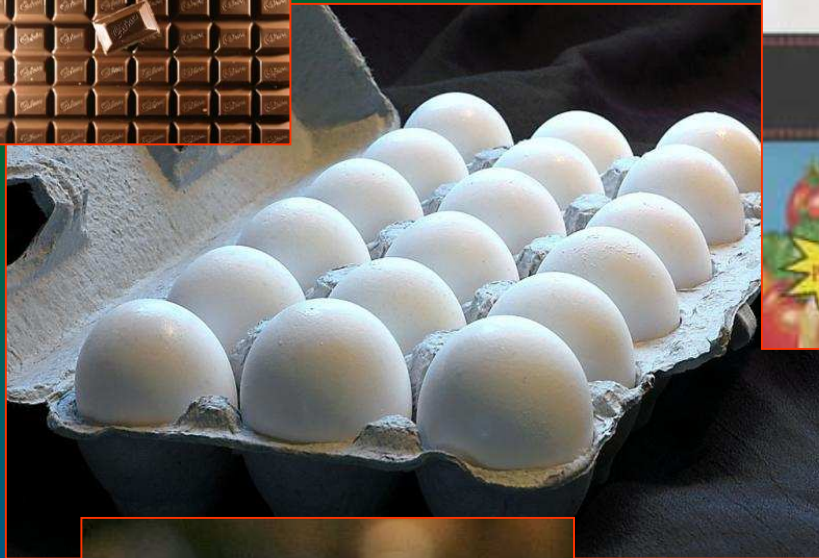
- **Well developed infrastructure** for the identification of outbreaks that results in:
 - Identification of the causative organism
 - Food alerts issued
 - Tracking of affected persons
 - Recalls of contaminated foods
- **Law companies** specialising in defending outbreak victims (MarlerClark)
- This sends a **powerful message** to industry
- **Results** in better understanding of outbreak dynamics:
 - Food types prone to contamination
 - The types of organism responsible

Selected USA Food Outbreaks

Year	Cause	Food	Cases	Recall	States
2009	Salmonella	Peanut butter	≥ 22500 / 9	Massive	
2009	E.coli 0157	Cookie dough	70		30
2008	Salmonella	Peppers	1307 / 2		43
2007	Botulism	Chilli sauce		Massive	
2007	Salmonella	Peanut butter	425	Massive	44
2006	E.coli 0157	Spinach	198 / 3		25
2002	E.coli 0157	Mince	19	19 million pounds	6

Pertinent Points

- **The American big 5** = E.coli 0157 [13 outbreaks], Salmonella [10], Botulism [9], Listeria [3] & Hepatitis A [2]. This was over 46 years.
- **High risk foods:** Processed foods [11 outbreaks], fresh produce [8], mince / beef [7], fruit juice [3], dairy [3].
- Most of these **outbreaks** were widespread.
- Many led to **massive recalls of product**
- Approx **58% of USA outbreaks** originate from commercial food facilities. No doubt linked to the American love for fast-foods, convenience foods and eating out.



A. THREATS RELATED TO DIARRHOEAL OUTBREAKS:

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Threats Continued



- **Threats from Globalisation**

- Rapid globalization of food production & trade has increased the likelihood of international incidents involving contaminated food
 - Melamine-tainted products from China
 - Added to boost the protein value of foods
 - Causes kidney stones and eventually renal failure
 - Cover-up before the Beijing Olympics

- **Threats related to International Events**

- Confederation Cup, 2010 World cup
- A major outbreak at such an event is potentially disastrous for the image of the country

INFOSAN

- **INFOSAN = International Food Safety Authorities Network**
 - **Developed & managed by WHO since 2005 because of these threats**

International Outbreaks

YEAR	FOOD	ORG	SOURCE	COUNTRIES Affected	Known CASES
2001	Peanuts	Salmonella	Australia	Australia, Canada, UK	40
2006	Oysters	Norovirus	France	France & Italy	213
2006	Salad	S. sonnei	Airline in Hawaii	Japan & other unspecified countries	15
2007	Basil	Salmonella	Israel	UK, USA, Holland, Denmark	?
2007	Baby Corn	Shigella	Australia	Australia & Denmark	230
2008	Lettuce	E.coli 0157	Holland	Holland & Iceland	50

B. OUTBREAK RESPONSE:

- 1. Outbreak Response Teams**
- 2. Laboratory**

Outbreak Response Teams

- **Outbreak response teams** consisting of EHPs & Medical practitioners and perhaps also lab staff – the aim is to limit the spread & terminate the outbreak
 - NICD outbreak surveillance unit
 - Training of EHPs
 - Guidelines Document for the management of Food borne diseases in SA issued in 2004 by DOH
 - Special events policy
- Dissemination of **food safety information**
- **Public awareness**
 - What to do when affected by food poisoning



Photos by Dr Lucille Blumberg
NICD

B. OUTBREAK RESPONSE:

1. Outbreak Response Teams

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Outbreak Response - Lab

- **Laboratories** that are able to rapidly test food samples & identify causes of food poisoning
- **Need to be able to deal with food and clinical samples**
 - Stool / rectal swabs
 - Vomitus
- **Molecular fingerprinting**

Laboratory Factors in Food Safety - 1

- **Laboratory infrastructure**
 - Limited number of labs testing food – not profitable
 - Profile of tests run in peripheral laboratories is often limited
 - Samples referred to centralised labs from rural areas
 - Cold chain
 - Courier delays
 - Samples sent to wrong lab (chemical / toxin tests requested)
 - Contact details unavailable (discuss test profile requested)
 - Sample insufficient
 - No pathogens isolated

Laboratory Factors in Food Safety - 2

- **Laboratory accreditation**
- Use of sensitive, **standardised test methods**, e.g. ISO, AFNOR, etc
- **Problems with ISO methods**
 - Labour-intensive (man power may not be available / unaffordable)
 - Expensive (small or no profit margin)
 - Sometimes impractical (Media that is expensive, unstable & complicated)
 - Not rapid
- **Lab automation**
 - Microbiology the least automated of all disciplines
 - Automation in its infancy

Semi-Automated Food Microbiology

- **Some Currently Available technologies:**
 - Tempo (Biomérieux): TPC, Colif, E.coli, Y&M
 - ISO, AFNOR
 - Vidas (Biomérieux): IDs Salm, List, 0157 etc
 - AFNOR, AOAC, validation
- **Technologies with promise for the future:**
 - Flow-cytometry
 - Developments with PCR-based technologies





The Amazon Cookie Outbreak

- 2 September 2002
- WSSD – ± 2 busloads of children ± 28 seen in Casualty dept JH
- 8 vomit samples & Amazon cookies (NB to obtain clinical & food samples)
- Next day ingredients of Amazon cookies were received
- *Bacillus cereus* was cultured from several ingredients and *B. cereus* toxin was identified in several ingredients
- Contaminated food destroyed = Outbreak halted

Summary of the Lessons for SA

- Any & every type of food may become contaminated
- Largest potential dangers linked to food manufacturing industry / water contamination
- Food outbreaks will occur but it is how well we handle them that counts (e.g. WSSD), especially at international events
- Preparedness in terms of good Outbreak Response teams and good lab infrastructure are essential



What about your food safety?

- **Basic principles**
 - Hand hygiene
 - Avoid cross-contamination
 - Cook adequately
 - The 2 – hour rule
 - Eating out: avoid buffet, salads, pink hamburgers, big days (e.g. Mother's Day, Christmas etc)
 - Do not use damaged or blown canned items
 - And when all else fails – report outbreak to the nearest Environmental Health officer: Local Government section of Telephone directory – JHB Regions A-G