

**MECIDS Annual Meeting  
Amman January 16-18, 2007**

## Jordan Salmonella Report

Disease Control Directorate  
Ministry of Health, Jordan



### Outline

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- Background: Jordan Burden of Illness Study
- MECIDS objectives
- Methods
- Results
- Conclusions & Recommendations



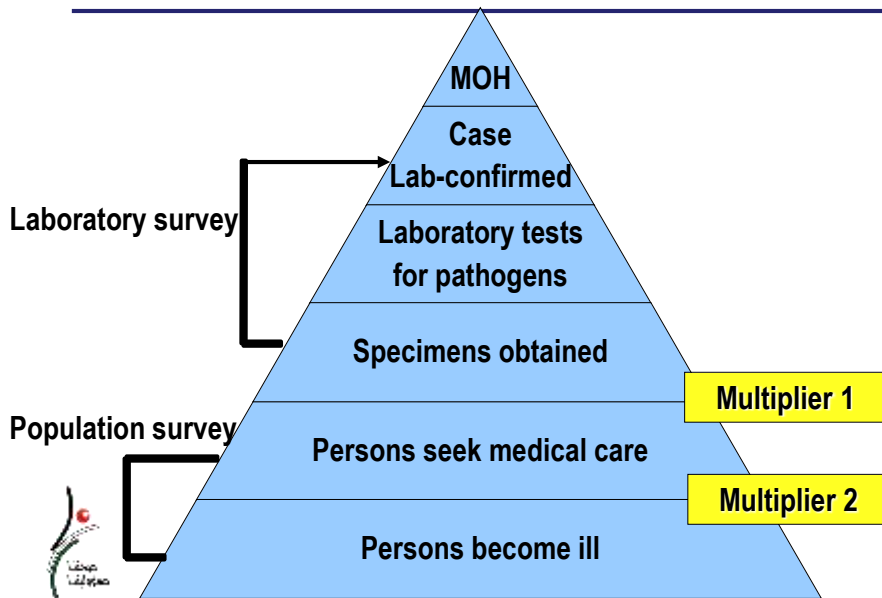
# Jordan Burden of Illness Study



- Jordan first site in Eastern Mediterranean
- Burden of *Salmonella*, *Shigella*, *Brucella*
- Burden of illness study
  - Population survey
  - Laboratory survey
- Validation study



## Measuring the burden of foodborne illnesses



Cases of *Salmonella* and *Shigella* in stool cultures\*



	Sep. 03		May 04	
	Freq	%	Freq	%
<i>Shigella</i>	7	1.0	3	0.6
<i>Salmonella</i>	1	0.1	3	0.6
Stools	696		495	



\*In 24 MOH lab

Comparison of laboratory survey results & MOH Reports



	Lab survey		MOH Reports	
	Freq	%	Freq	%
<i>Shigella</i>	10	0.8	3	0.01
<i>Salmonella</i>	4	0.3	13	0.03
Stools	1191*		41273†	



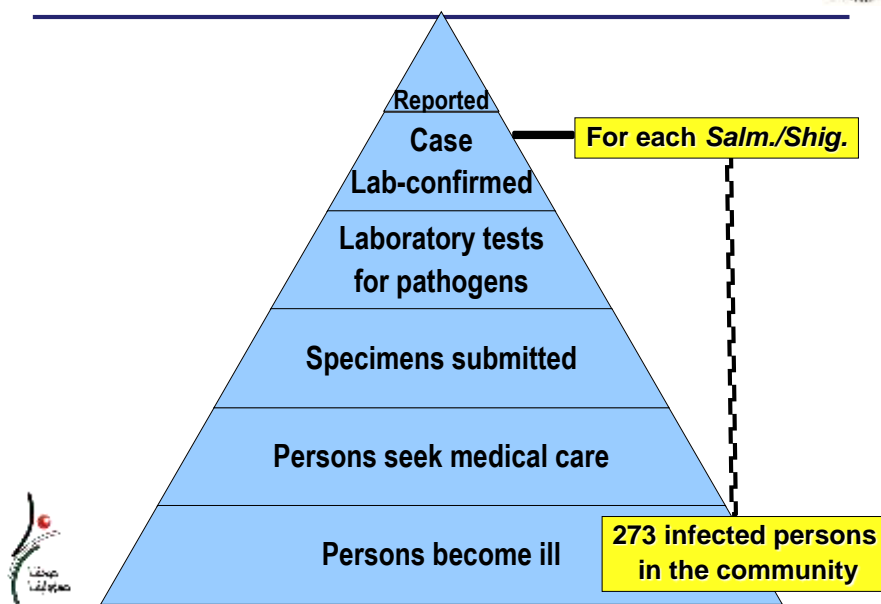
\* cultured

† tested: food handlers probably included, unknown procedures

## Jordan Diarrhea Burden

	Sep 03	May 04
Population >1year	5316696	5316696
% diarrhea	7.8%	6.1%
# population diarrhea	414702	324318
% diarrhea sought care	19.5%	40.8%
# population diarrhea sought care	80867	132322
% diarrhea sought care MOH	8.9%	16.2%
# population diarrhea sought care MOH	36909	52540
Stools received MOH	696	495
<i>Shigella</i>	7	3
<i>Salmonella</i>	1	3

## Measuring the burden of foodborne illnesses



## Estimated Burden of Foodborne Pathogens Jordan 03-04\*



Pathogen	Yearly burden	IR/100,000
<i>Salmonella</i>	6606	124
<i>Shigella</i>	16266	306
<i>Brucella</i>	6912	130



\*Only 50% of Jordan's population seeks care in MOH facilities.

## Comparison of Isolation Rates of Foodborne Pathogens between Lab. Survey & Validation Study\*



	Lab. Survey			Validation Study		
	Freq	Total	%	Freq	Total	%
<i>Salmonella</i>	1	696	0.1	2	80	2.5
<i>Shigella</i>	7	696	1.0	13	80	16.2
<i>S.Typhi</i>	0	1085	0	0	14	0
<i>Brucella</i>	31	1510	2.0	0	14	0



\* Jordan Aug—Sep 2003

## MECIDS objectives

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- Establish sentinel laboratory-based surveillance in Israel, Jordan, and PA
- Enhance laboratory capabilities to identify *Salmonella*
- Strengthen existing capabilities and develop new ones for characterization of *Salmonella* using phenotypic and genotypic markers



## Methods

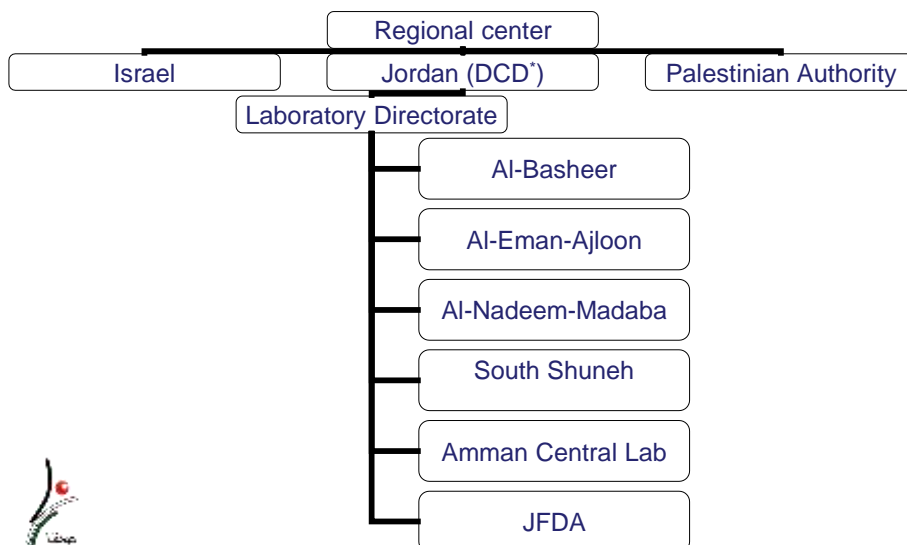
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- Meetings at national and regional levels
- Sentinel sites
- Study population
- SOPs
- Training (local & regional)
- Data collection forms (lab. logbooks, reporting forms)



## Data flow chart



## Training




MoH Lab. Training Center, Amman, Sept 2006



## Data collection forms



  
Monthly report—Reporting Unit

District: \_\_\_\_\_ Hospital: \_\_\_\_\_ Month: \_\_\_\_\_

**Table 1. Blood culture**

Tablet	Specimen type	Total
IP		
OP		
PH		
Total		

**Table 2. Urine culture**

Tablet	Specimen type	Total
IP		
OP		
PH		
Total		

Are there other (non-urinary) specimens other than blood or stool?

Yes  No

If yes, specify:

**Table 3. Laboratory-profile questions other than blood and stool**

Tablet	Number
Specimen type	
OP	
Total (specimens)	

IP: In-patient OP: Out-patient PH: Food handler



## Methods



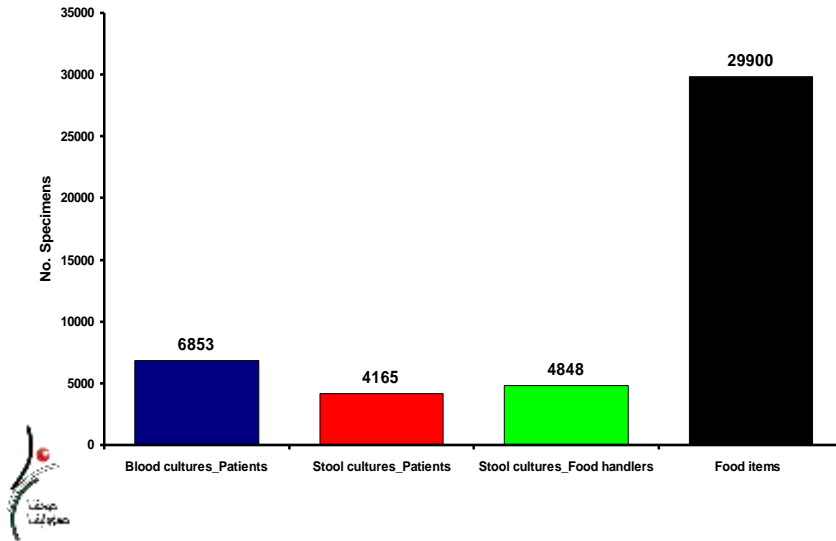
- Data collection started in July 2005
- Information on specimens tested recorded routinely
- Aggregated numbers sent monthly by fax to Lab. Directorate & DDC\*
- Data entered and analyzed at DDC using Microsoft Excel
- Monthly reports sent to CMC Amman



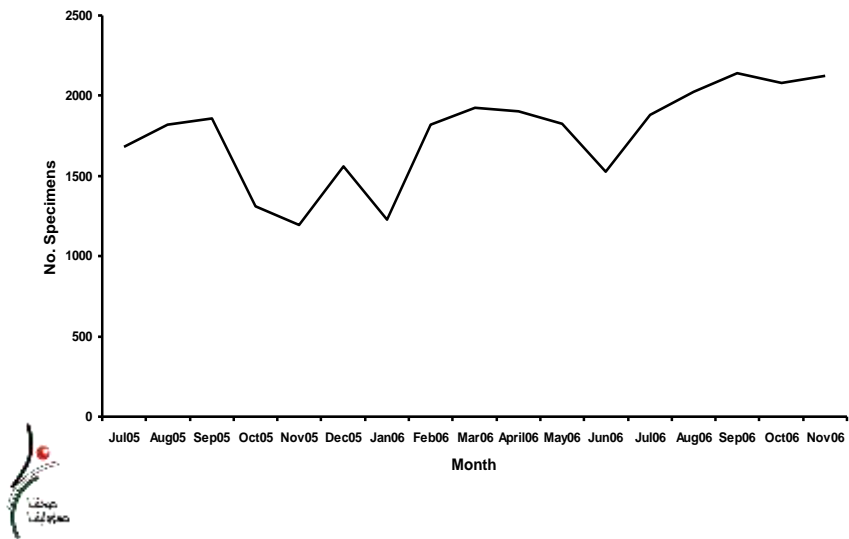
\*Disease Control Directorate



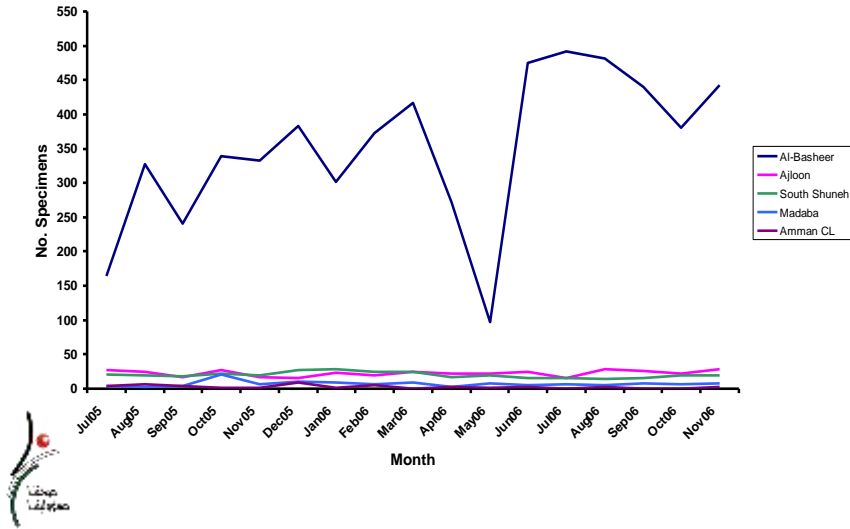
## Specimens Tested Jordan Jul 05-Nov 06



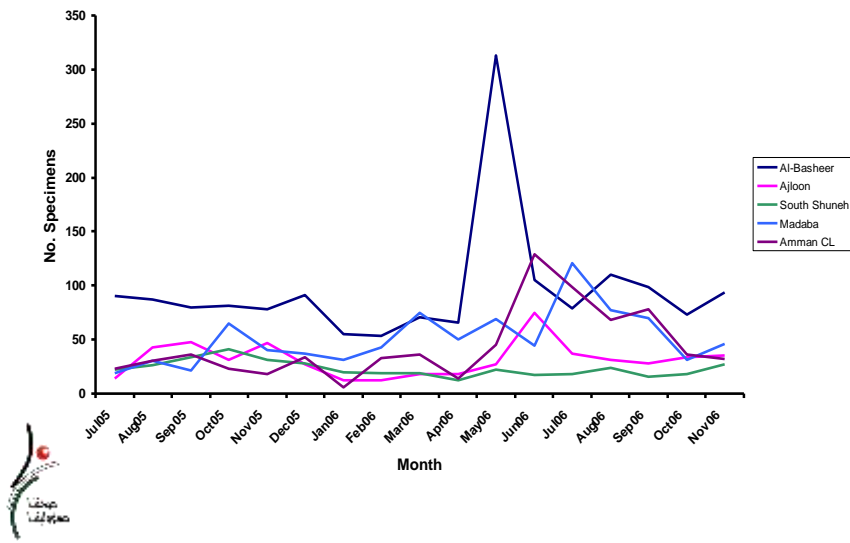
## Food Items Tested Jordan Jul 05-Nov 06



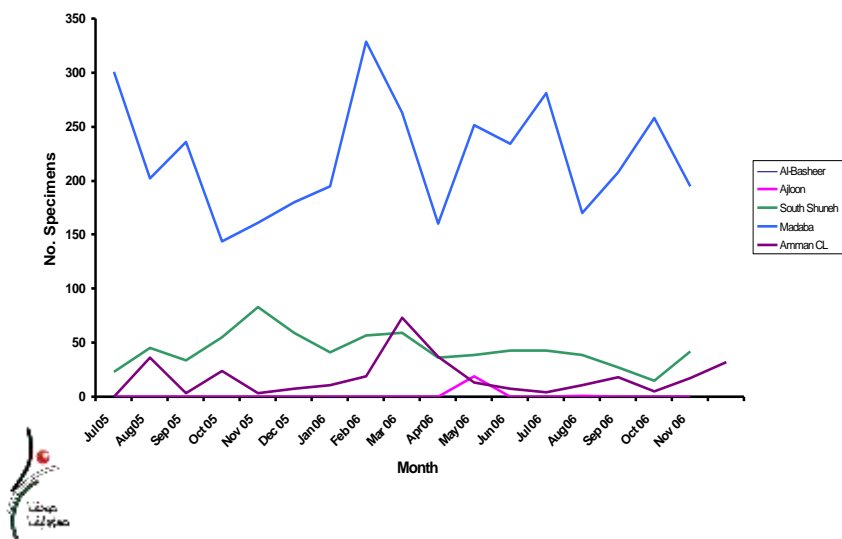
## Blood Specimens Tested Jordan Jul 05-Nov 06



## Patients Stool Specimens Tested Jordan Jul 05-Nov 06



## Food handlers Stool Specimens Tested Jordan Jul 05-Nov 06



## Isolation Rate of *Salmonella* by Type of Specimen Jordan July 05-Nov 06



	<i>Salmonella</i> isolates		Total
	Freq	%	
Blood cultures_Patients	9	0.13	6853
Stool cultures_Patients	64	1.54	4165
Stool cultures_FH	74	1.53	4848
Food items	7	0.02	29900



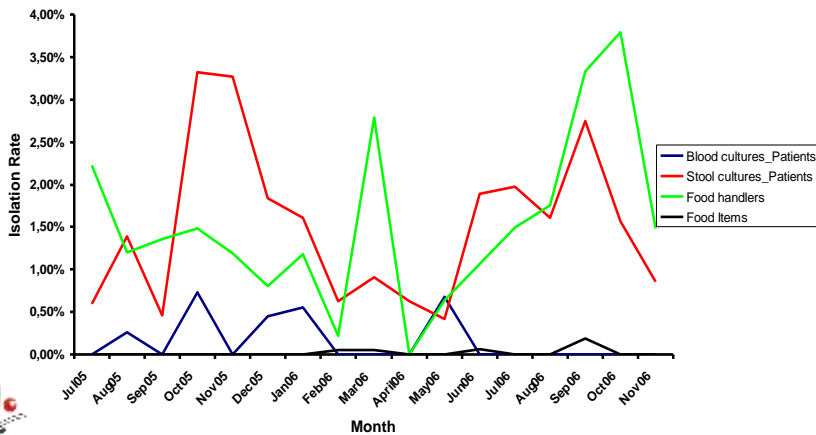
## Isolation Rate of *Salmonella* by Type of Specimen Jordan July 2005-June 2006



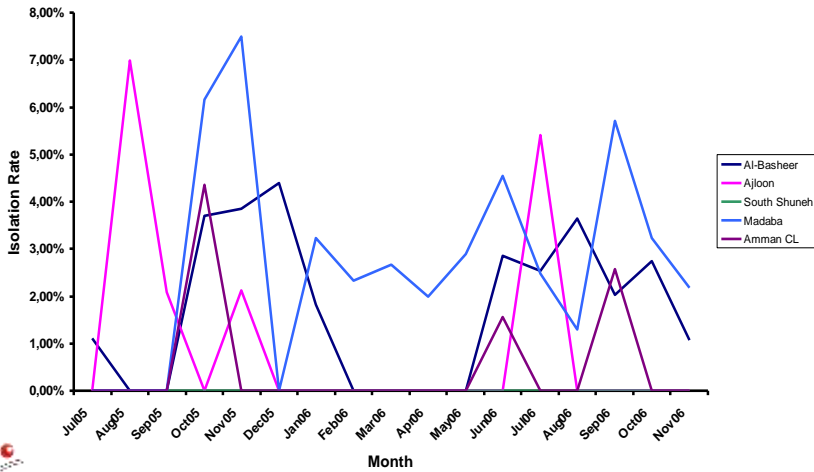
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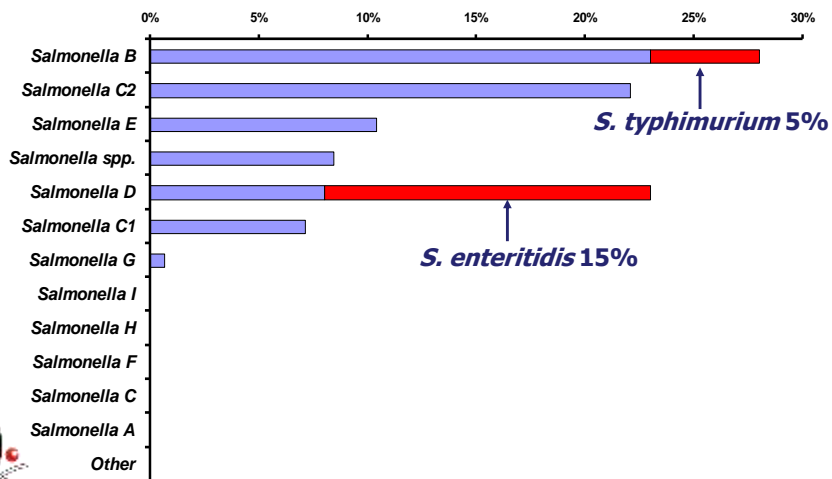
## Isolation Rate of *Salmonella* by Month Jordan July 2005-June 2006



## Isolation Rate of *Salmonella* by Sentinel Laboratory Jordan July 2005-June 2006



## Percentage of *Salmonella* Isolates by Serogroupe



## Conclusions

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- System is useful and operates efficiently
- Similar *Salmonella* rates in stools from patients (1.54%) & food handlers (1.53%)
- Overall *Salmonella* rate in stool: 1.5%
- Rates comparable to those of developing countries (1.8%) and tenfold lower than rates in developed countries (0.15%)\*



\*Chaker & Baker, 1988. A review of human salmonellosis

## Conclusions

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- Higher than rates laboratory survey (0.3%), lower than rates in validation study (2.5%)\*
- High *Salmonella* burden ( $[64+74]*273 \sim 38,000$  cases in 18 months)
- High % of *S. enteritidis*



\*Jordan Burden of Illness Study

## Recommendations

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- **At sentinel lab level**

- Continue *Salmonella* surveillance system
- Add *Shigella* using same diagnostic procedures and mechanisms of reporting
- Test for other entero-pathogens (*Campylobacter*, *E. coli*, etc.)
- Establish electronic reporting from sentinel labs



## Recommendations

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- **At reference lab level**

- Use PFGE
- Establish electronic reporting from reference lab

- **At regional level**

- Training?
- Compare & publish data



# Acknowledgements

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**Ministry of Health**

**CMC**

**Palestinian & Israeli  
partners**

**NTI**

**World Bank**

