

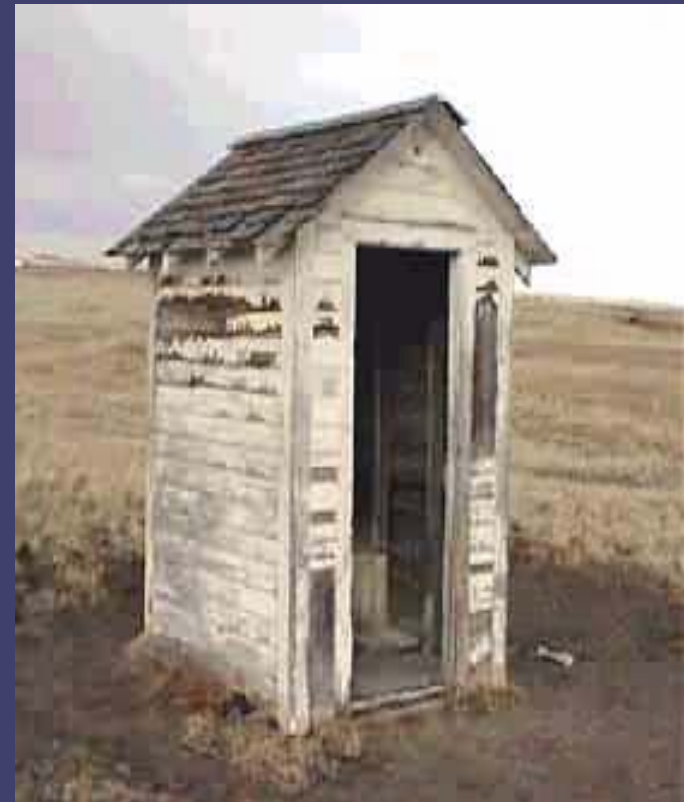


BC Centre for Disease Control
AN AGENCY OF THE PROVINCIAL HEALTH SERVICES AUTHORITY

Diarrhea in BC: How much? What cost?

The NSAGI initiative

BC Food Protection Conference, Oct 18, 2007
Laura MacDougall, Epidemiologist, BCCDC



Public Health
Agency of Canada

Agence de la santé
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How much IGI illness occurs?

Current sources of information

- Traditional surveillance
- Outbreak investigations
- Hospitalization data

Special studies

- Population-based studies capture sporadic and unreported illness
- In 2000, PHAC began the **NSAGI** initiative, to determine the burden of acute GI in the population

www.phac-aspc.gc.ca/nsagi-engma/index.html

OBJECTIVES

- Describe the burden of IGI
 - Examine IGI in high risk occupations
- Describe lab practices re: IGI
- Describe public health reporting practices



Estimate under-reporting of IGI

Estimate the cost of IGI

Surveillance pyramid



Surveillance pyramid

1

How many cases are reported to surveillance?

Public Health Survey

How often are laboratory-confirmed cases reported?

Laboratory survey

How often are tests positive?

2

Laboratory survey

How often do laboratories test for a pathogen?

Laboratory survey

How often are specimens requested/submitted?

3

Population survey

How often do ill persons seek medical care?

Population survey

Surveys

1

Public health survey

Ontario and BC, 2001, paper based

Described regional to provincial CD reporting

2

Laboratory survey

Conducted Canada-wide, 2000, paper based

Differences in laboratory diagnostics and reporting

3

Population survey

Pilot in Hamilton

BC: June 2002 – June 2003, cross-sectional,
telephone

Experience of IGI in previous month

3

BC Population Survey

- Study population
 - EK, Van, NI
 - 4,612 interviews; 44% response rate
- Methods
 - Randomized list of telephone #s
 - Introductory letter
 - Within household randomization
 - Definition of IGI
 - Any vomiting or diarrhea in 28 days prior to interview
 - DX = any loose stool or stool with abnormal liquidity
 - Excluded GI as a result of:
 - Pre-existing medical conditions e.g. Crohn's
 - Food allergies
 - Pregnancy
 - Medication use

Burden of IGI - BC



- 9.2% monthly prevalence
 - 1.3 episodes of illness per person/year
 - Extrapolates to ~5 million cases/year in BC
 - 1.2% of cases were hospitalized (~60,000 people/year)
- Cases more likely:
 - Female*
 - To be <15 years *
 - From larger households
 - Have higher levels of education
- Average duration of illness = 3 days
- Bimodal distribution peaking in summer and winter

* Remained sig. on multiple regression

K. Thomas et al. BMC Public Health (accepted 2006)

How much is Foodborne?

Using rate of acute GI illness:

1.3 **x** **75%¹** **x** **23-36%¹**

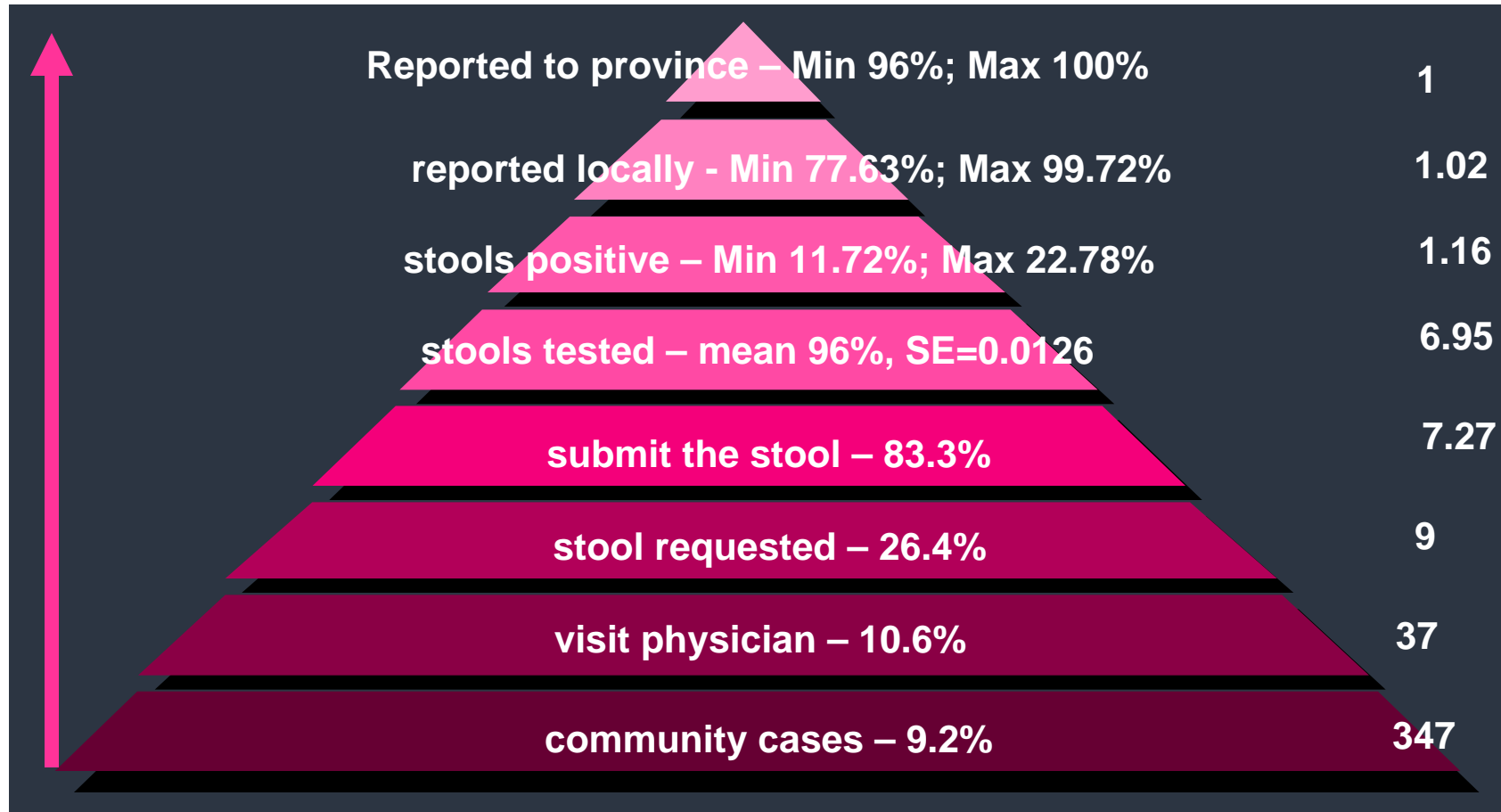
Episodes/person/year **x** % non-respiratory **x** % foodborne



98 thousand – 1.5 million illnesses / year

¹ Mead et al, Hall et al, Adak et al.

Under-reporting of IGI



5th and 95th percentile estimates: 181 - 611

IGI in High Risk Occupations

Of 223 employed adults with GI in British Columbia:

- 14 (6%) were food handlers
 - 2 (1%) were day care workers
 - 22 (10%) were health care workers
- } **17% high risk**

Relative risk of discontinuing work when ill (compared to those working in low-risk employment settings):

- Health care workers: 1.5 (95% CI: 1.2 - 2.0)
- Day care workers: 2.0 (95% CI: 1.7 - 2.3)
- Food handlers: 1.0 (95% CI: 0.6 - 1.7)

Need to revisit the effectiveness of educational material?

IGI in High Risk Occupations

Common reasons for not staying home when ill¹:

- *Illness not serious enough*
- *Can't afford time off*
- *Employer depends on me/nobody to cover*

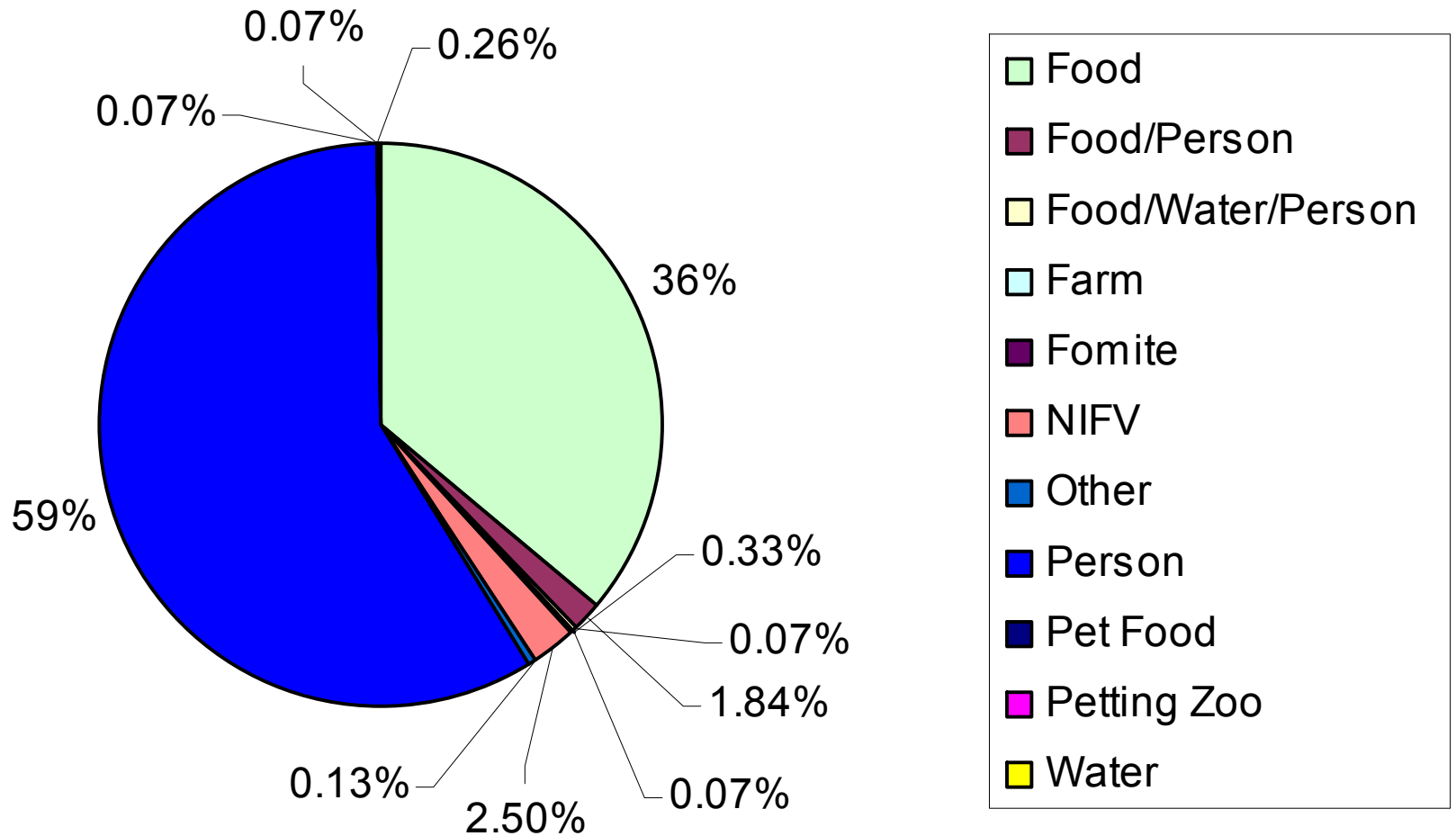
Outbreaks caused by ill food handlers 1927-2006²:

- 816 incidents
- 80,682 cases associated

¹ Thomas et al. 2006 *CCDR* 32:16

² Greig et al. 2007 *J. Food Prot.* Jul

BC Outbreaks 2001-06



How much does it cost us?

- Societal cost analysis
- Resource units estimated for:
 - physician visits; specialist visits; house calls
 - emergency room visits; hospitalizations
 - diagnostic stool tests
 - the use of antibiotics and other prescription medications
 - the use of over-the-counter medications and herbal remedies
 - days of missed paid employment by case and caregiver(s)
- Not included:
 - Costs related to death, chronic sequelae, QOL

Cost of IGI – Hamilton Pilot

- Mean cost per capita = \$115
 - Missed Employment 72%
 - Health care use 13%
 - OTC 12%
 - Lab testing 1.7%
 - Prescription 0.01%

BC Costs

- Detailed analysis being conducted
 - Same methodology as Hamilton
- If assume Hamilton costs reflective of BC:
\$115/capita/year x BC population =
~ \$500 million/year

Conclusions

- 5 million cases of IGI in BC/year costing 500 million
 - Significant burden of illness
 - Most costs societal; not borne by health care system
- Foodborne disease incidence estimated between 100K and 1.5M cases/yr
- Notifiable enteric disease data are highly under-reported (347 community cases per reported case)
 - Under-reporting likely varies by pathogen
- Interventions aimed at foodhandlers/employers are warranted re: work self-exclusion

GI rate comparison



Country	Episodes/ person-year	Case Definition
BC/Hamilton	1.30	diarrhea or vomiting/ 24hr
US	1.30 0.72	≥3 stool/24hr Above + (duration >1 day or missed school/work)
AU	0.92	With resp sx: ≥3 stool or 2+ vomit/24hr W/o resp sx: ≥4 stool or 3+ vomit/24hr
Norway	1.20	≥3 stool/24hr or 3 GI symptoms
Holland*	0.45	≥2 stool/24hr + 2 GI symptoms OR vomiting + 2 GI symptoms
UK*	0.20	

* Prospective studies