Trends in Indigenous Foodborne Disease & Deaths, England & Wales: 1992-2000

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Food-related illness and death in the United States

- 76 million (approx) cases of foodborne disease per year
- 325,000 hospital admissions
- 1,800 deaths

Mead *et al* Emerging Infectious Diseases 1999: **5**; 607-625.

The approach

CDC

PHLS

Lab confirmed cases from collaborating labs

↓ *Extrapolated*

All Lab confirmed cases

↓ *Assumed*

All cases

↓ *Expert opinion*

All foodborne cases

All Lab confirmed cases

↓ *IID Study*

All cases

↓ *O/B surveillance/studies*

All foodborne cases

Methods

Nontyphoidal salmonellas E&W 2000

Ascertainment ratio = 3.8 **IID Study**

Laboratory confirmed cases = 14,845 **PHLS LabBase**

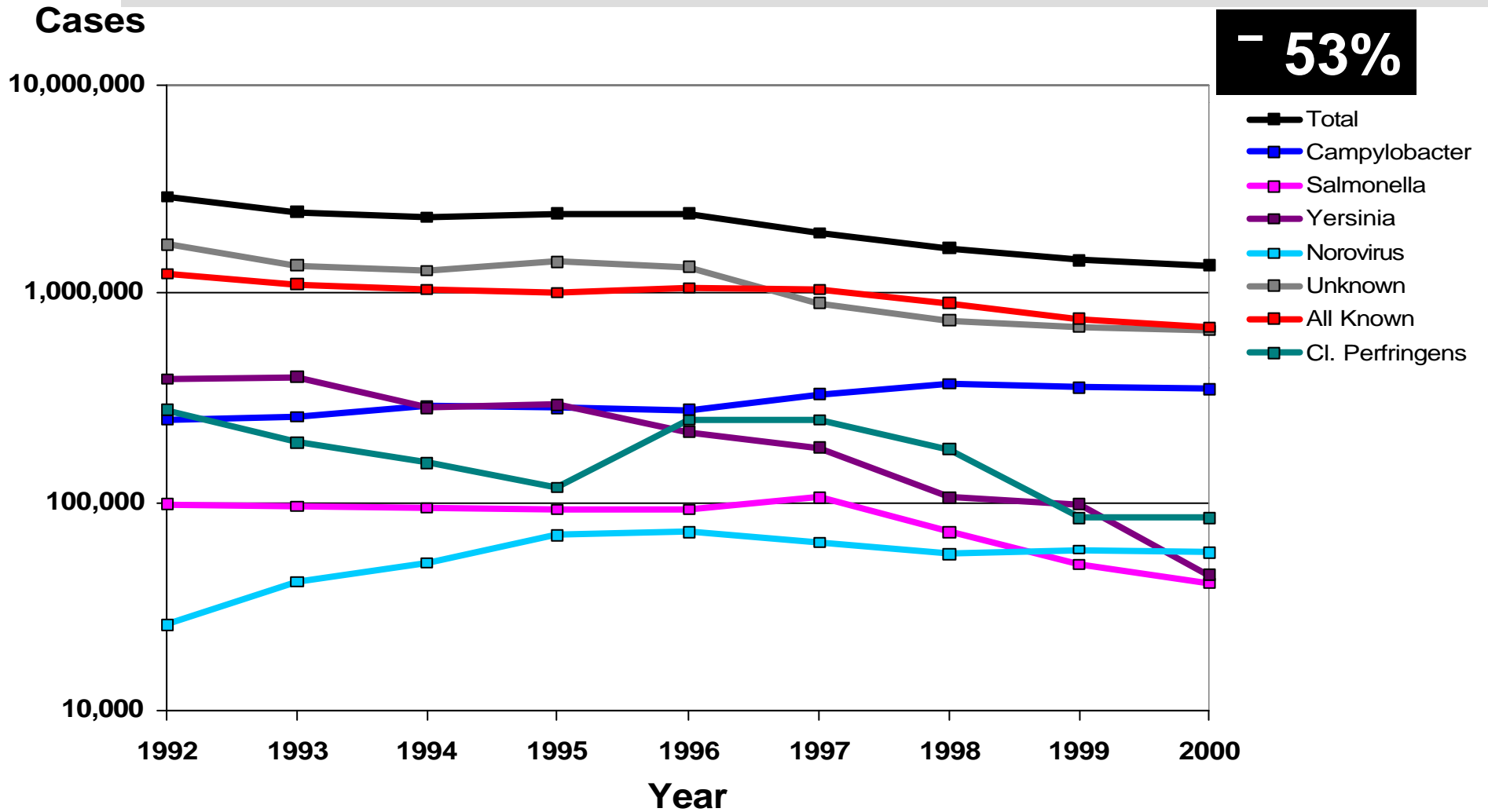=> Estimate for total salmonella cases England & Wales
3.8 x 14,845 = 56,411

After adjusting for travel and non-foodborne transmission
Home acquired foodborne salmonella cases = **40,776**

Results - Estimated indigenous foodborne disease (IFD)

Cases

− 53%

Legend:
- Total
- Campylobacter
- Salmonella
- Yersinia
- Norovirus
- Unknown
- All Known
- Cl. Perfringens

Year

NB - Norovirus is the new designation for Norwalk-like virus

Results – Estimated IFD 1992-2000

All cases	**-53%**
Yersinia spp	-89%
Cl. perfringens	-70%
Unknown aetiology	-61%
Salmonellas	-58%
Norovirus	+126%
Campylobacter spp	+45%

Results - Estimated hospital admissions due to IFD
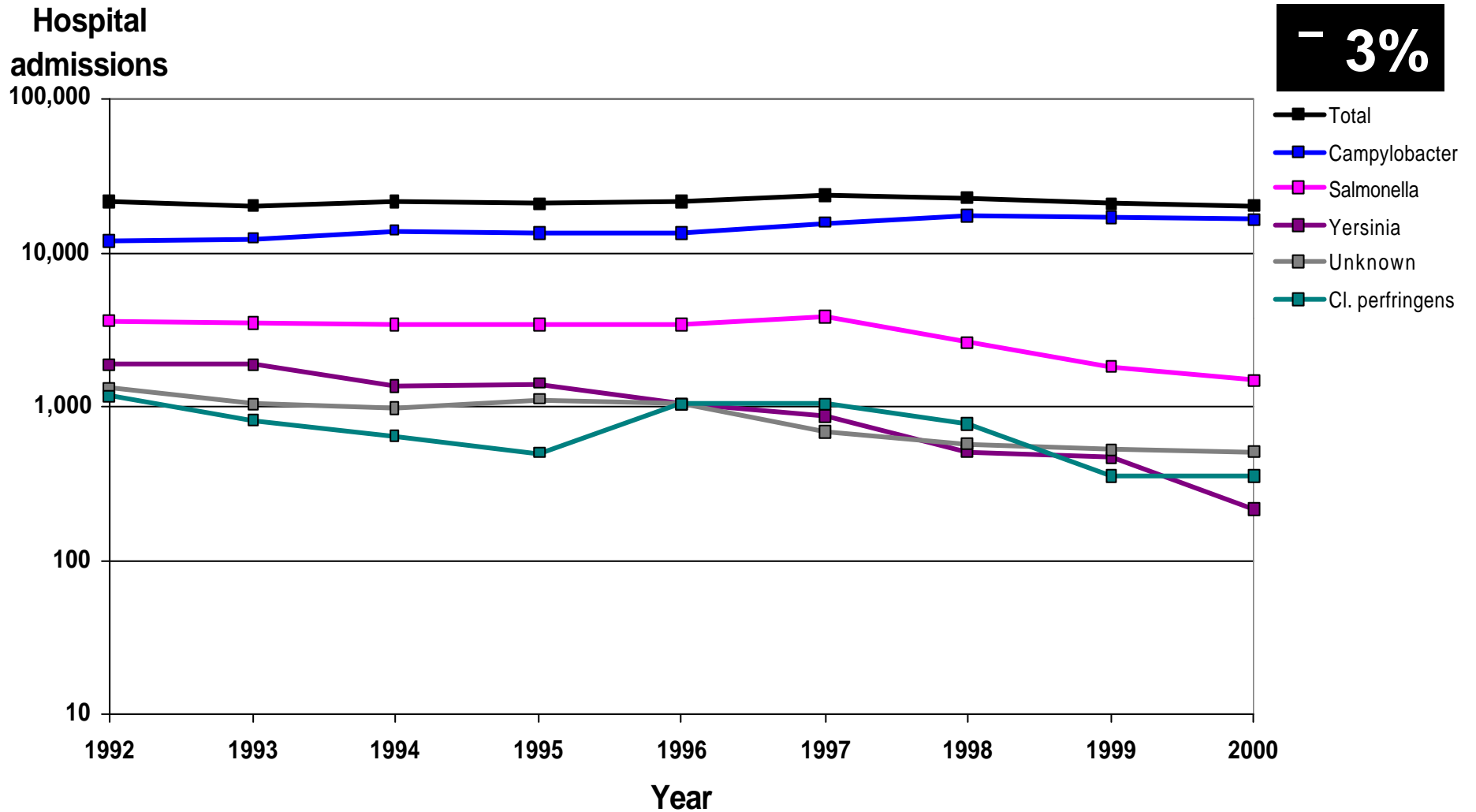
Results - Estimated deaths due to IFD
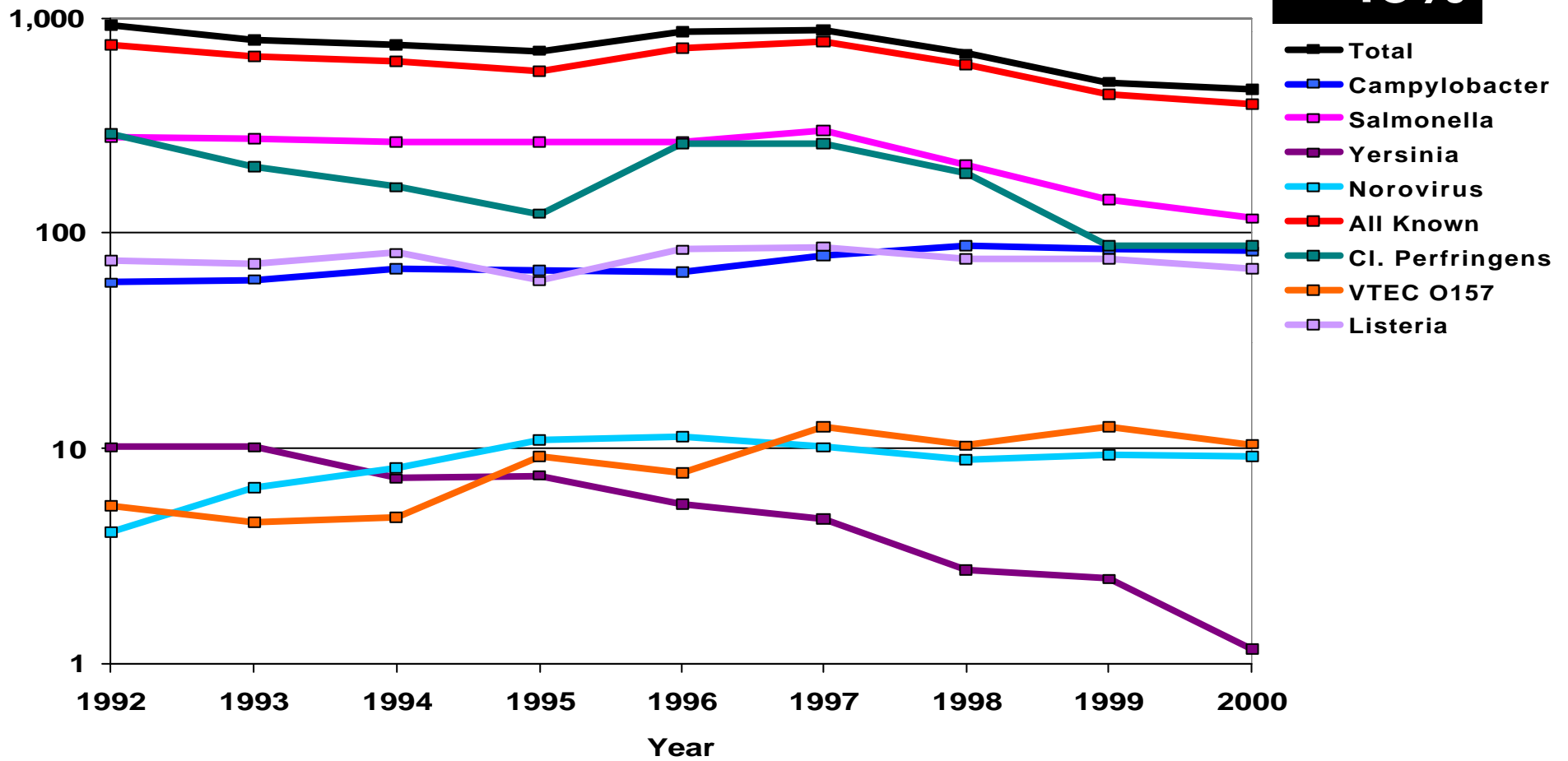
Results - Pathogens under surveillance - 2000

%IFD

Legend:
- **Others** (black)
- **Campylobacter** (dark blue)
- **Norovirus** (light blue)
- **Salmonella** (magenta)
- **Cl. perfringens** (teal)
- **Listeria** (light purple)
- **VTEC O157** (orange)

Bar values: Cases 47.4, GP 74.2, Hosp 95.9, Bed days 96.4, Deaths 84.8
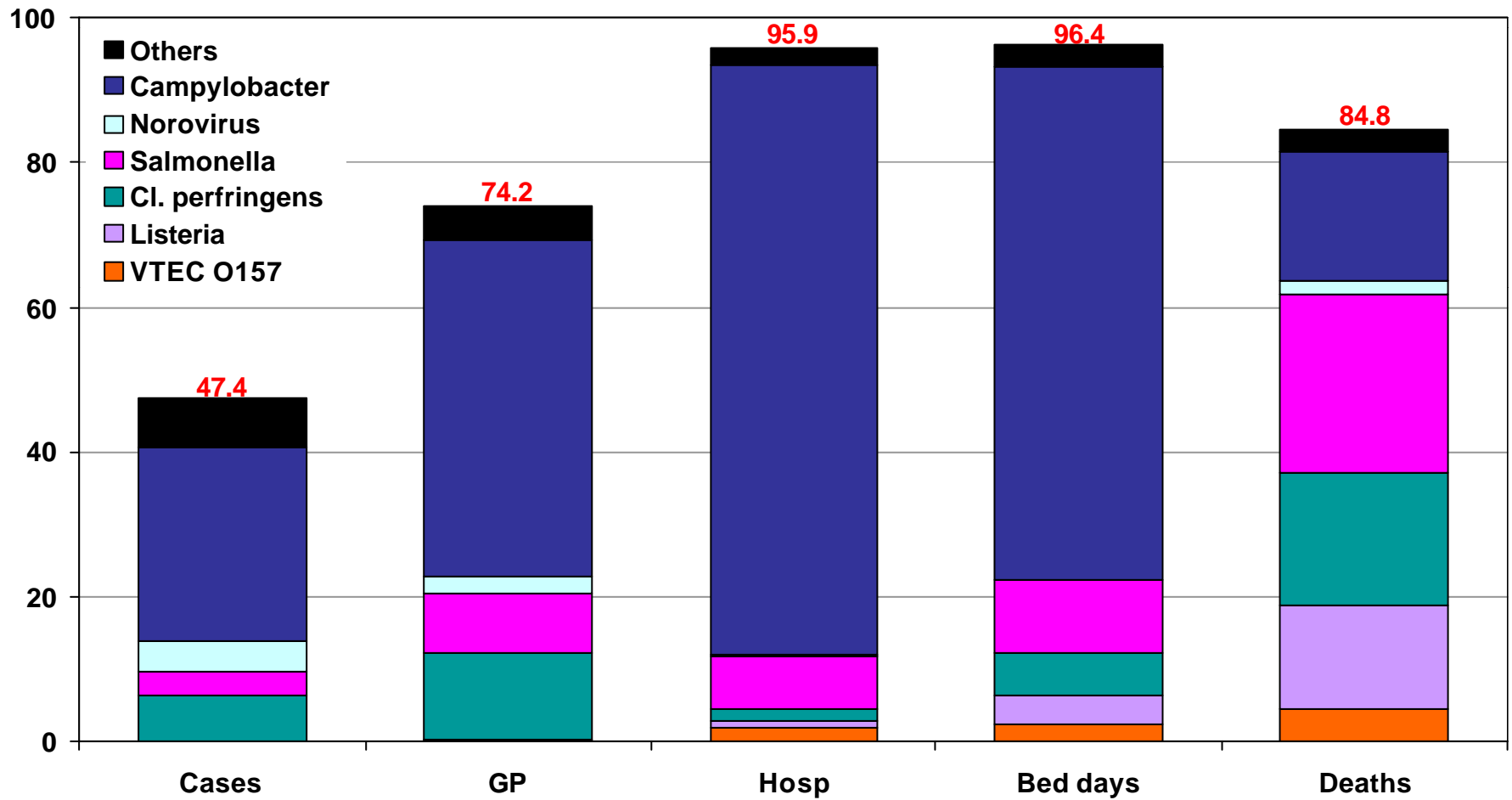
Results - CDC vs PHLS

	CDC	PHLS	Adj Pop	Ratio
Cases	76M	1.3M	6.8M	**11.2**
Known	13.8M	0.7M	3.5M	**3.8**
Bacteria	4.2M	0.6M	3.1M	**1.3**
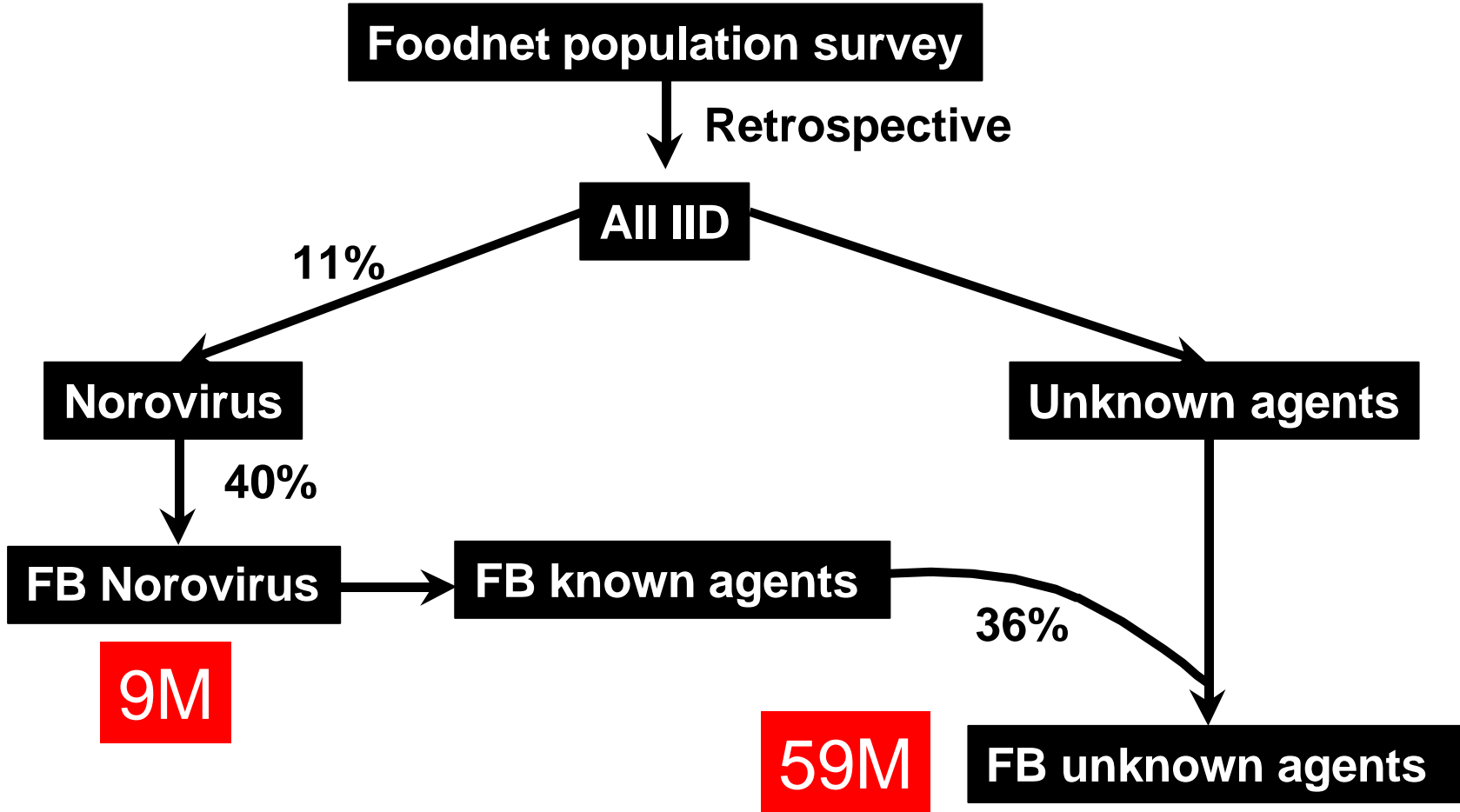
Sources of bias - systematic

IID Study - Effects

Robustness of incidence data

Common pathogens >> rare pathogens

eg *Campylobacter* spp >> *Vibrio* spp

Thus for this model:

a 1% error for *Campylobacter* spp

has the same effect as

a 2,900% error for *Vibrio* spp

Sources of bias - systematic

PHLS laboratory report data

- Trends might be affected by changes in lab methods.

- Improved methods have been introduced for Norovirus in the last three years.

Conclusions

***Campylobacter* spp needs to be tackled**

Campylobacter spp infection results in the most:
- GP consultations (46% of total, 63% known pathogens)
- Hospital admissions (82% of total, 85% known)
- Hospital bed days (71% of total, 73% known)

Campylobacter spp is ranked second:
- to unknown aetiology for cases (57% of known agents)

Campylobacter spp is ranked third:
- to salmonella and *Cl. perfringens for* deaths (18% of total 21% of known)

Conclusions

Salmonella is still important

- The number of foodborne cases has declined sharply since 1997. However foodborne salmonellosis accounted for:

    - 29,726 GP consultations in 2000

    - ranked second to *Campylobacter* spp for hospital admissions and hospital occupancy

    - ranked first for deaths

Conclusions

Norovirus is important

- Morbidity

Clostridium perfringens **is important**

- Morbidity and mortality

Listeria monocytogenes **is important**

- Severe morbidity and mortality

VTEC O157 is important

- Severe morbidity and mortality
- Propensity towards causing large outbreaks

Conclusions

This model provides an evidence based method for:

- Isolation of foodborne disease from all IID
    - accounting for travel associated disease
- Comparing the contributions of different aetiological agents
- Examining morbidity and mortality
- Describing trends
- Setting priorities

Conclusions

However this model is a first step, it can be used to define areas where further work is needed:

- Better data are needed for:
  - risk factors
  - specific pathogens
  - morbidity
    - long term effects
  - mortality

Conclusions

The future
- New microbiological methods
- NHS reform
- NHS direct
- HPA

For this model to be used more reliably in the future there is a fundamental requirement for recurrent recalibration exercises

Conclusions

2000

Cases of home acquired foodborne disease	**1,338,772**
GP consultations	**368,516**
Admissions to hospital	**20,759**
Hospital occupancy (bed days)	**88,545**
Deaths	**480**

Beware!

2000 - Norovirus

Cases	1,218,985 (43%)
GP consultations	193,490 (33%)
Admissions to hospital	774 (3%)
Hospital occupancy (bed days)	3018 (3%)
Deaths	193 (28%)