

Analysis of Mortality at the National level



G. T. Innocent, D. Ewing, J. Liu & I. J. McKendrick

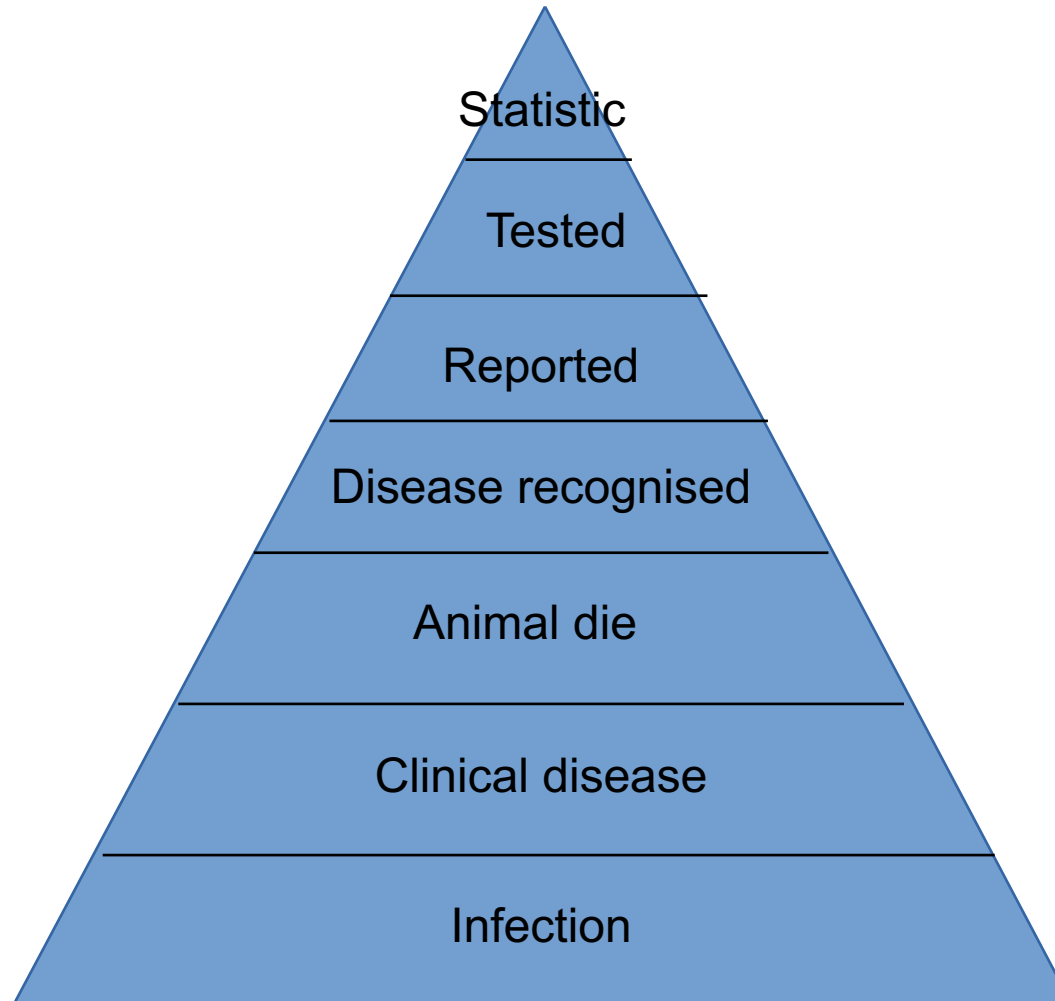
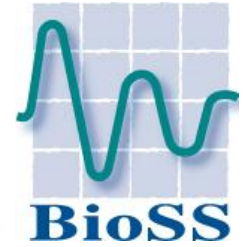
Data - Ethiopia: mortality in small ruminants



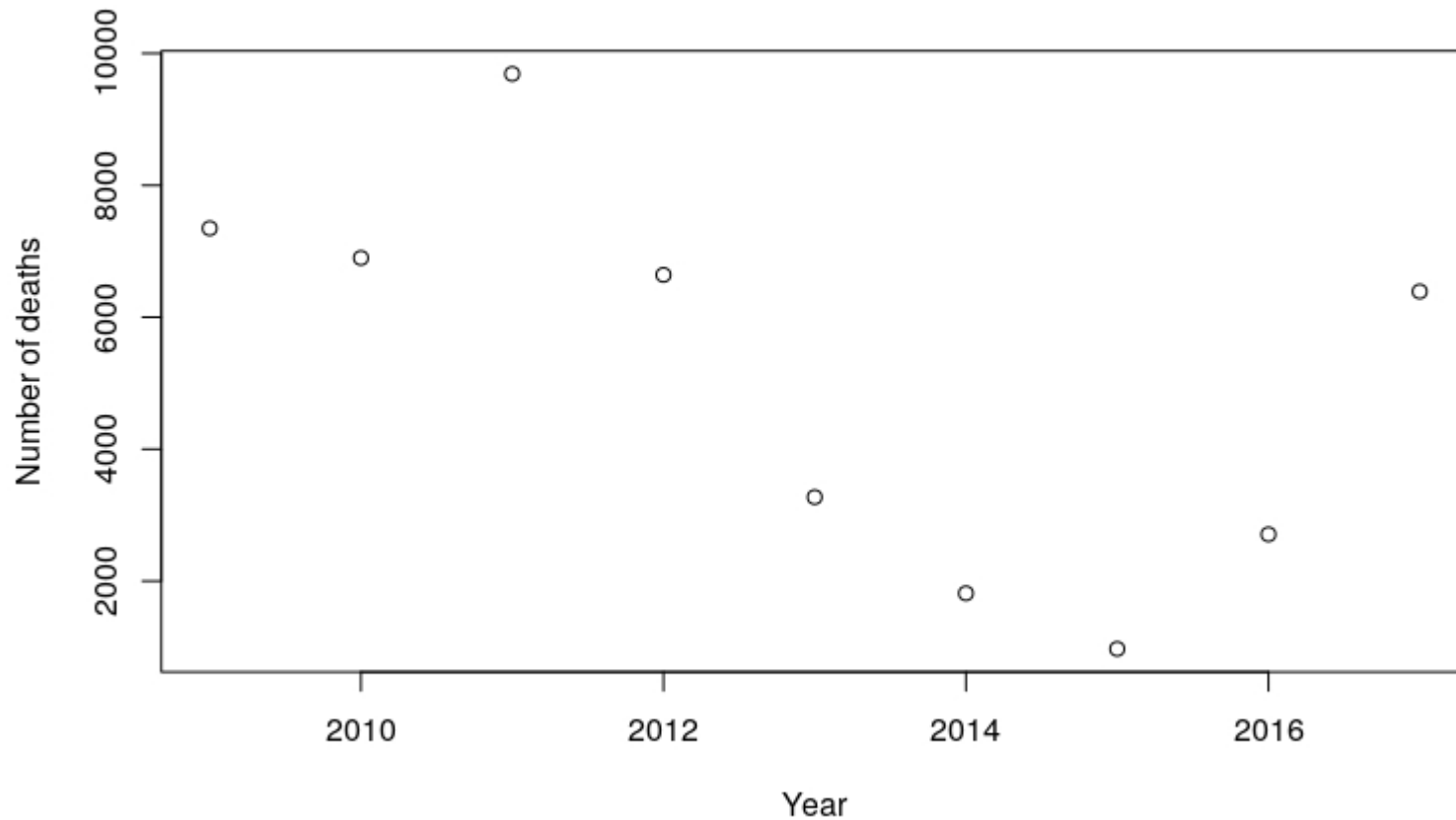
- **DOVAR: Disease Outbreak and Vaccination Reporting**
 - Monthly recording
 - Outbreaks of notifiable diseases in livestock
 - Several years' data (2009–2017)

- **Living Standards Measurement Study–Integrated Surveys on Agriculture (LSMS–ISA)**
 - Biennial survey
 - Economic survey – World Bank
 - Unknown sampling strategy but meant to be “nationally representative”

Pyramid of disease



DOVAR - small ruminant mortality over time



Summary



- **Mortality differs by:**
 - Region
 - Year
 - Disease
- **Disease pattern changes across Regions and Years**
- **Even within Region the disease pattern changes across years**
- **Why so much variability?**

LSMS - small ruminant mortality



- 6457 animal holdings
- 5305 recorded zero deaths (82%)
- Non-zero records show deaths are clustered (within holding)
- Problem with mortality:
 - most of the time no deaths
 - sometimes many deaths



Conclusions

- **Mortality is not a good indicator**
 - pyramid of disease
 - preponderance of zeros (zero-inflated)
 - highly clustered (overdispersion)
 - difficult to evidence change

- **Would outbreaks be better?**
 - average 2 per year
 - minimum 3 years of 0 outbreaks per year
 - minimum 15 years of 1 outbreak per year