DAIRY CATTLE EXPOSURE AND ZOONOTIC DISEASE IN NEW ZEALAND

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Enteric Zoonoses

- Enteric diseases pose a substantial public health and economic problem in NZ
- Annual incidence rates in NZ are high by comparison to other industrialized nations
- Dairy cattle are a known reservoir for a number of pathogens that can cause human illness, including:
 - Campylobacter
 - Cryptosporidium
 - Giardia
 - Salmonella
 - Shiga toxin-producing E. coli (STEC)

Potential Transmission Pathways



Methods

- Data were assembled on livestock densities, disease rates, and population estimates for small areas (meshblocks and census area units)
- Dairy cattle numbers were obtained from the Agribase[™] database for the years 2000, 2006 and 2014
- Population estimates were obtained from Statistics New Zealand for census years 2001, 2006, and 2013
- Notified cases of campylobacteriosis, cryptosporidiosis, giardiasis, salmonellosis, and STEC infection from 1997-2015 in New Zealand were obtained from ESR
- Series of maps were produced in ArcGIS

Dairy Cattle Density Over Time







Change in Dairy Density 2000-2014



Change in Exposure to Dairy Cattle 2000-2014



Interface Between Humans and Dairy Cattle



Cryptosporidiosis Rates







STEC Infection Rates







River Water Quality in New Zealand





Conclusions

- The increase in dairy cattle densities may represent a substantial increase in exposure to zoonotic pathogens, especially in rural and peri-urban areas in NZ
- Initial comparisons between dairy cattle density and zoonotic enteric disease rates were inconclusive and are complicated by multiple transmission pathways
- Next Steps

Questions?



Calvin and Hobbes by Bill Watterson

Thanks to my supervisors Simon Hales, Michael Baker, and Nigel French



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