

bTB: Frequency of indirect contact between badgers and cattle?

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Background

- Bovine tuberculosis (bTB) is caused by *Mycobacterium bovis*
- It is an endemic in NI with a herd incidence of 7.1%¹
- There is a National Eradication Programme including:
 - Annual herd testing
 - Post-mortems of cattle slaughtered for human consumption
- Badgers are a wildlife reservoir for the disease
- 17% of roadkill badgers examined in NI are confirmed as *M. bovis* positive²
- Badgers and cattle share the same strains of bTB locally
- Direct contact between cattle and badgers is very rare³
- The mechanism of disease transmission is unknown
- Indirect contact may be via faecal or urine-contaminated fomites
- This study aims to quantify indirect contact rates between cattle and badgers at possible contaminated sites



Fig. 1 Badgers drinking at a water trough



Fig. 2 Cattle investigating a badger sett

Methods

- This study area was in a bTB hotspot in Co. Down
- 35 farms surveyed; 20 beef farms, 13 dairy & 2 unstocked
- Camera traps were placed at 6 locations on each farm:

Badger sites

1. Sett entrances
2. Latrines
3. Runs (track-ways)

Cattle sites

4. Water troughs
5. Feed stores
6. Farm buildings

- Cameras were left *in-situ* for 1 week
- There was a total of 66,360 hours of survey
- Visitation rates were calculated for each location type

Results & Discussion

- Badger detection was negatively associated with the numbers of detections of farming activity i.e. people and/or machinery ($OR: 0.210$; $p=0.001$), with badgers present at 39% of locations where farming activity was absent but only present at 12% of locations when farming activity was present.
- Badger detection was unrelated to the frequency of cattle detection ($OR: 0.722$ $p=0.478$).
- Badger detection was not significantly different when cattle were grazed or housed (Wilcoxon $W=5$, $p=0.486$)
- No badgers were detected entering farmyards either at farm buildings or feed stores suggesting such events are rare^{3,4} (Fig. 3)
- Badgers visited cattle sites (water troughs only) at a rate of 0.11 visits/day (but were observed drinking on only 5 occasions when cattle were absent)
- Cattle visited badger sites i.e. latrines and setts at a rate of 4.31 visits/day during the grazing season
- Close contact between badgers at cattle locations and cattle at badger locations was rare (i.e. animals at 0m distant) (Fig. 5 & 6)
- Only 5 latrines and 2 setts had badgers and cattle present during the same week
- Cattle encroached on badger locations 39 times more frequently than badgers encroached on cattle locations.

Conclusions

- Cattle frequently encroached on badger fomites but badgers rarely encroach on farmyards
- Raising the height of water troughs of ground level may decrease what limited indirect contact there was yet further

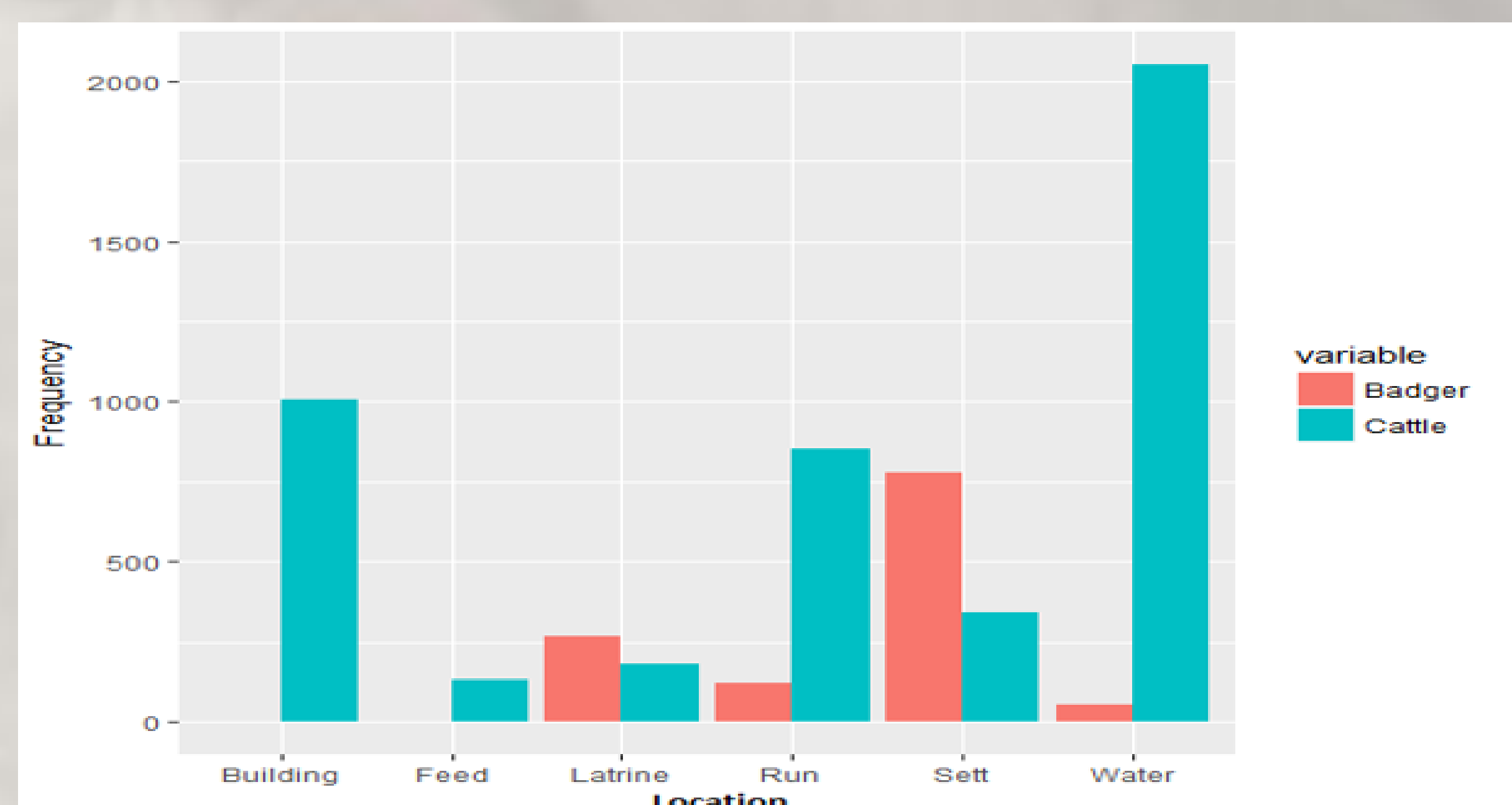


Fig. 3 Badger and cattle observations at each location

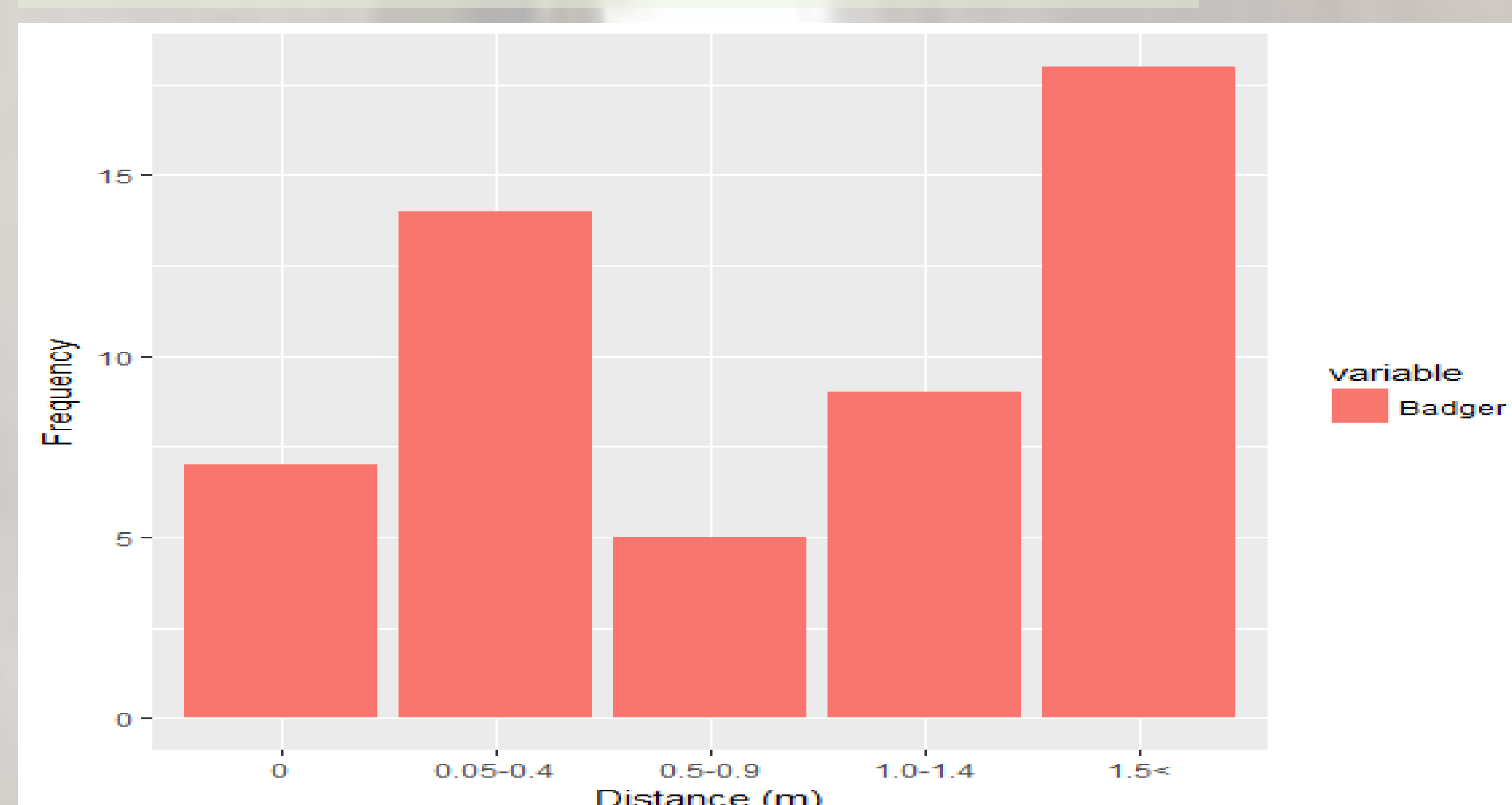


Fig. 5 Badger at distances from water troughs

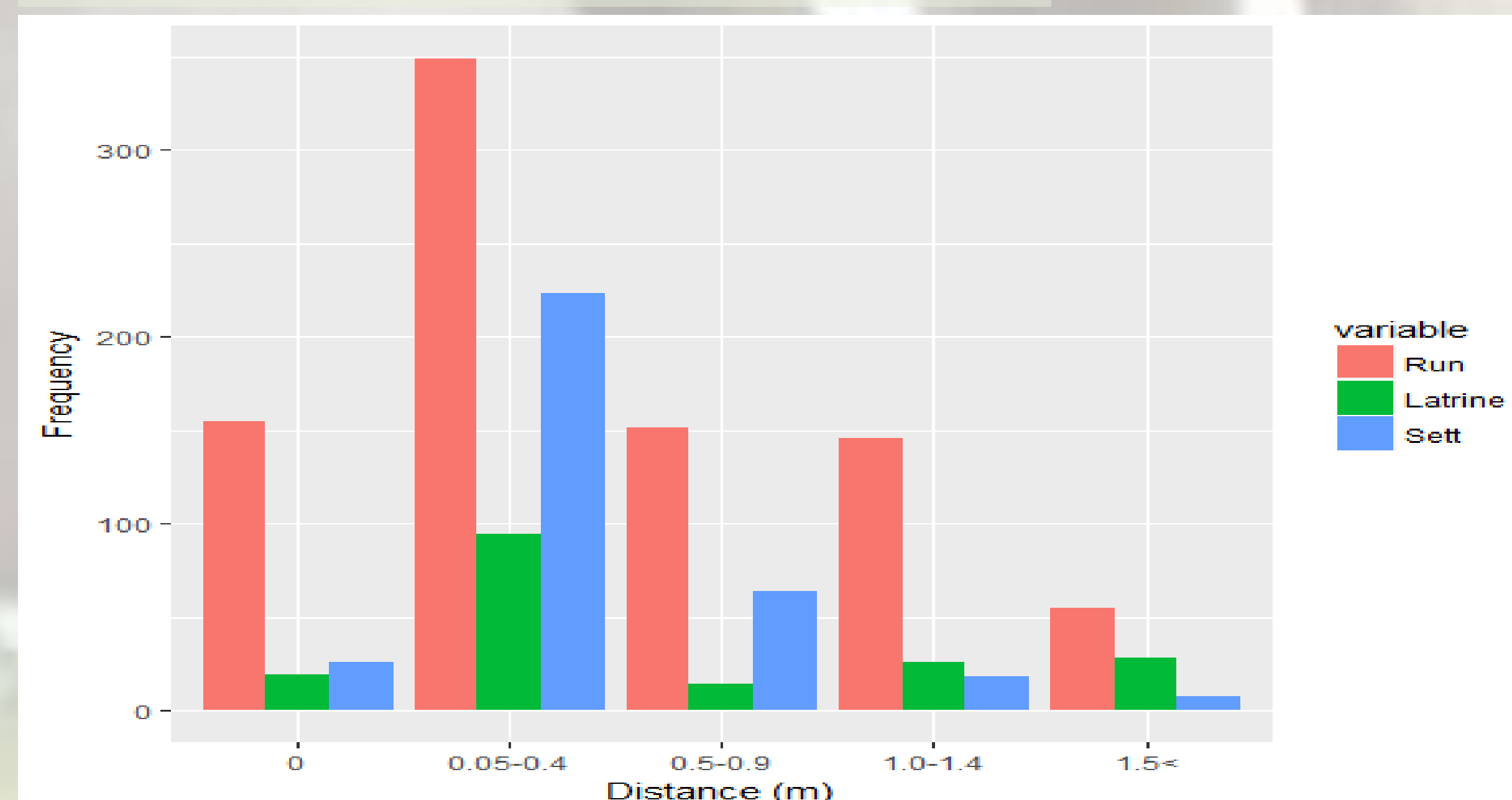


Fig. 6 Cattle observations at distances from potential fomites

References

1. Department of Agriculture, Environment and Rural Affairs. (2016) *Tuberculosis disease statistics in Northern Ireland*. Tuberculosis - Internet monthly statistics - October 2016.
2. Department of Agriculture, Environment and Rural Affairs (2009) *Association between M. Bovis strain types in cattle herds and road-kill badgers in NI*.
3. Woodroffe R, Donnelly C, Ham C, Jackson S, Moyes K, Chapman K, Stratton N, Cartwright S, Coulson T. Ecology Letters, vol. 19, issue 10 (2016) pp. 1201-1208.
4. O'Mahony D., Veterinary Journal, vol. 203, issue 1 (2015) pp. 126-128.