

- Sustained increase in resistant prion protein gene (PrP) genotypes compared to 2012/13
- Decrease in susceptible PrP genotypes compared to 2012/13
- Smaller flocks ( $\leq 100$  sheep) associated with higher resistant PrP genotypes

## INTRODUCTION

- Classical scrapie (CS) is a fatal, degenerative disease of sheep
- The Department for Environment, Food & Rural Affairs' National Scrapie Plan (NSP) ran from 2001 to 2009 to reduce classical scrapie prevalence through **selective breeding for resistance**
- Reduction of CS incidence from 400+ cases in 2002 to zero cases since 2019
- Aim: To evaluate the PrP genotype distribution of the sheep population in Great Britain for resistance to classical scrapie in 2021 compared to 2012/13

## METHODS

- Survey Period: January to December 2021
- Sample Size: **5,100 healthy sheep** from 11 abattoirs in England, Wales, and Scotland
- Testing: Brainstem samples genotyped
- NSP types categorised into Resistance Groups, with PrP genotypes defined as:

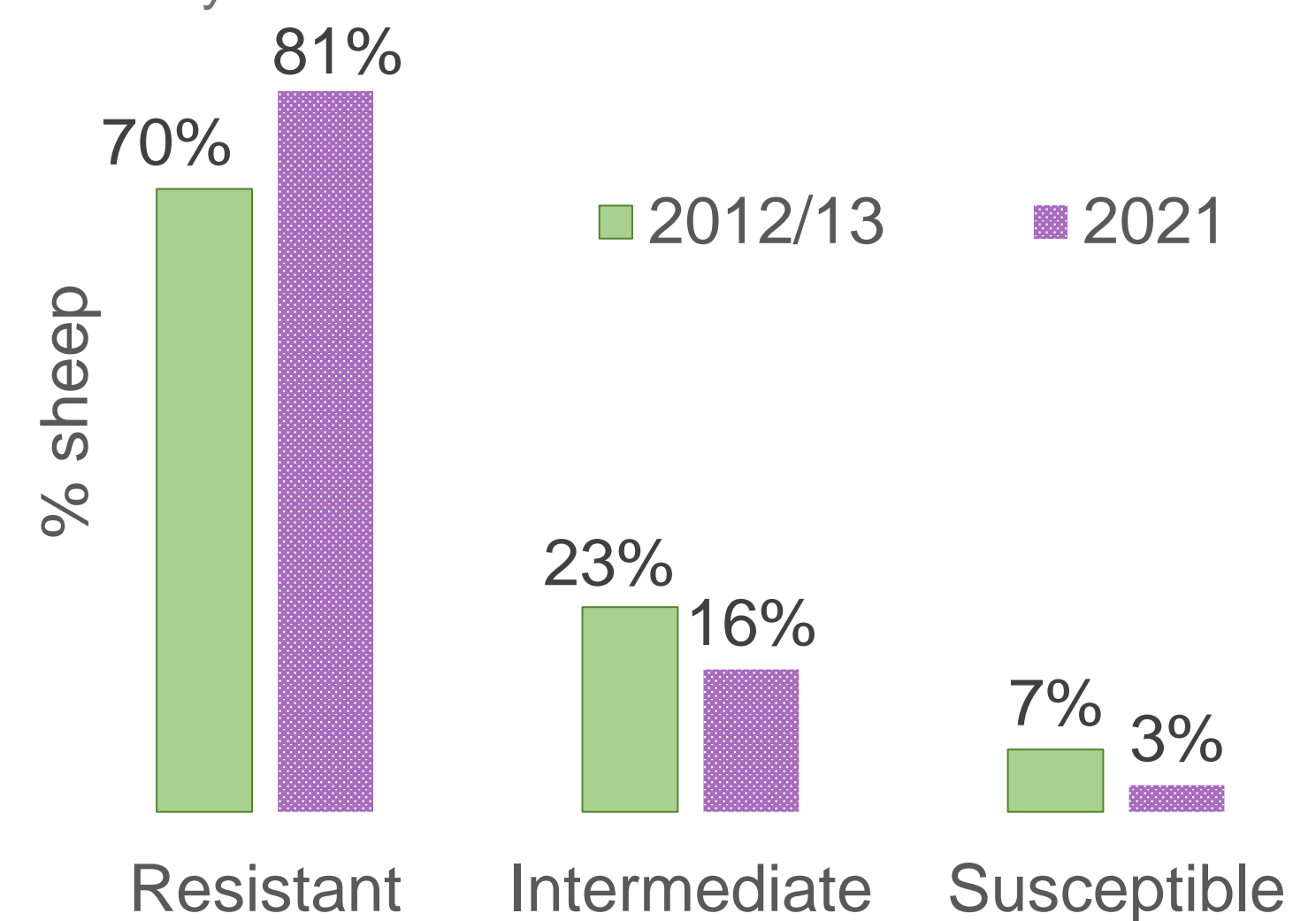
|                            |   |
|----------------------------|---|
| Resistant:<br>NSP I & II   | ARR/ARR, <b>ARR/AHQ</b> , <b>ARR/ARH</b> ,<br><b>ARR/ARQ</b>                  |
| Intermediate:<br>NSP III   | AHQ/AHQ, AHQ/ARH, AHQ/ARQ,<br>ARH/ARH, ARH/ARQ, ARQ/ARQ                       |
| Susceptible:<br>NSP IV & V | ARR/VRQ, <b>AHQ/VRQ</b> , <b>ARH/VRQ</b> ,<br><b>ARQ/VRQ</b> , <b>VRQ/VRQ</b> |

- NSP type II not as resistant as type I
- Spatial analysis: Choropleth maps of Standardised morbidity ratio (SMR) of Resistance Groups

## RESULTS

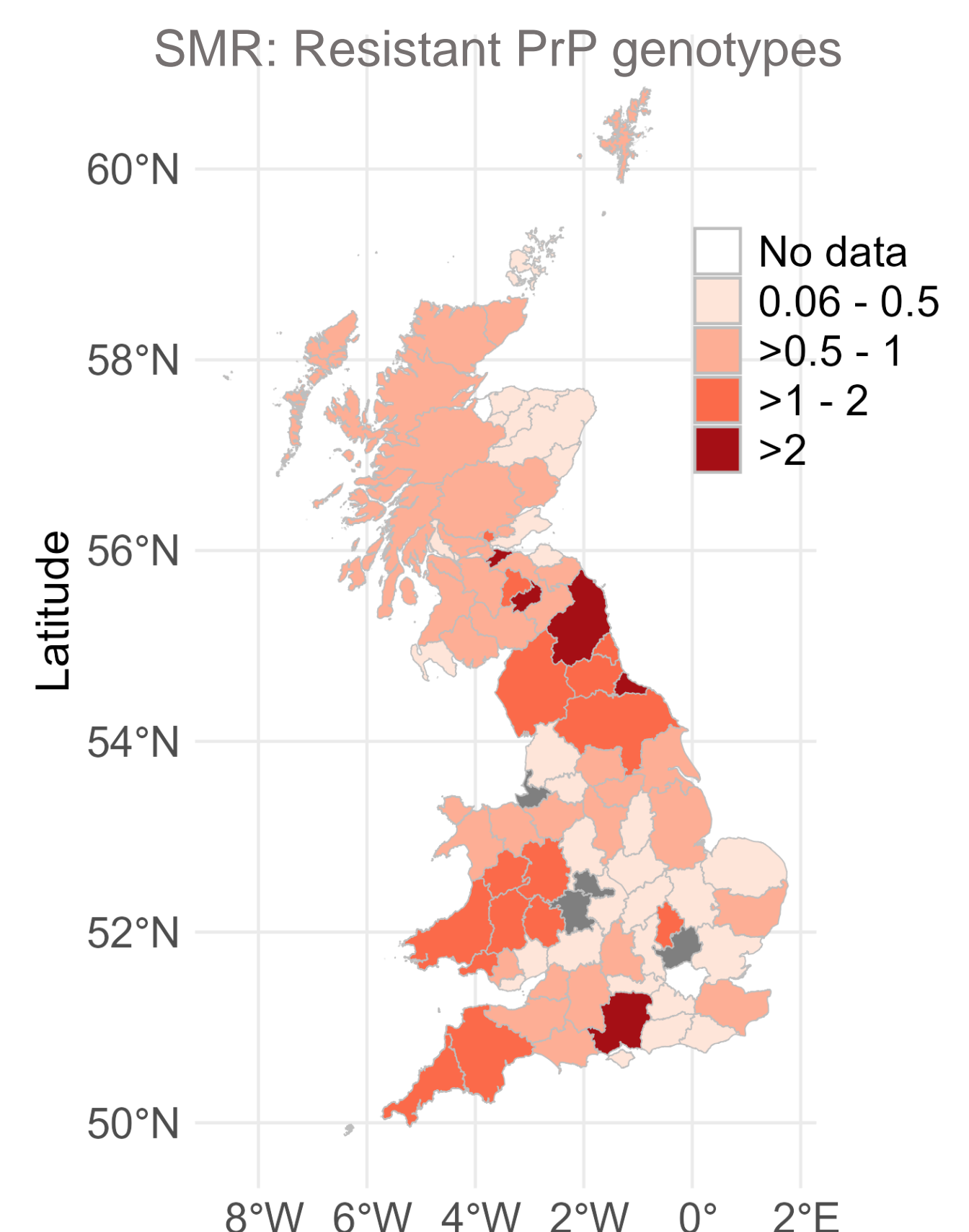
- Genotype Distribution compared to 2012/13\*
  - Resistant Genotypes (NSP I & II): **Increased from 70% to 81%**
  - Intermediate Genotypes (NSP III): **Decreased from 23% to 16%**
  - Susceptible Genotypes (NSP IV & V): **Decreased from 7% to 3%**

PrP Resistance Groups of sheep in Great Britain between surveys taken in 2012/13 & 2021



### Regional Variations:

- Northern England, parts of Wales and the Southwest of England with higher levels of resistance



## CONCLUSIONS

- Continued increase in resistant PrP genotypes post NSP programme
- Consistent with the decline of classical scrapie incidence over the years in GB

## ACKNOWLEDGEMENTS

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\*ORTIZ-PELAEZ, A., THOMPSON, C. E. & DAWSON, M. 2014. The impact of the National Scrapie Plan on the PRNP genotype distribution of the British national flock, 2002–2012. *Veterinary Record*, 174, 530-530.