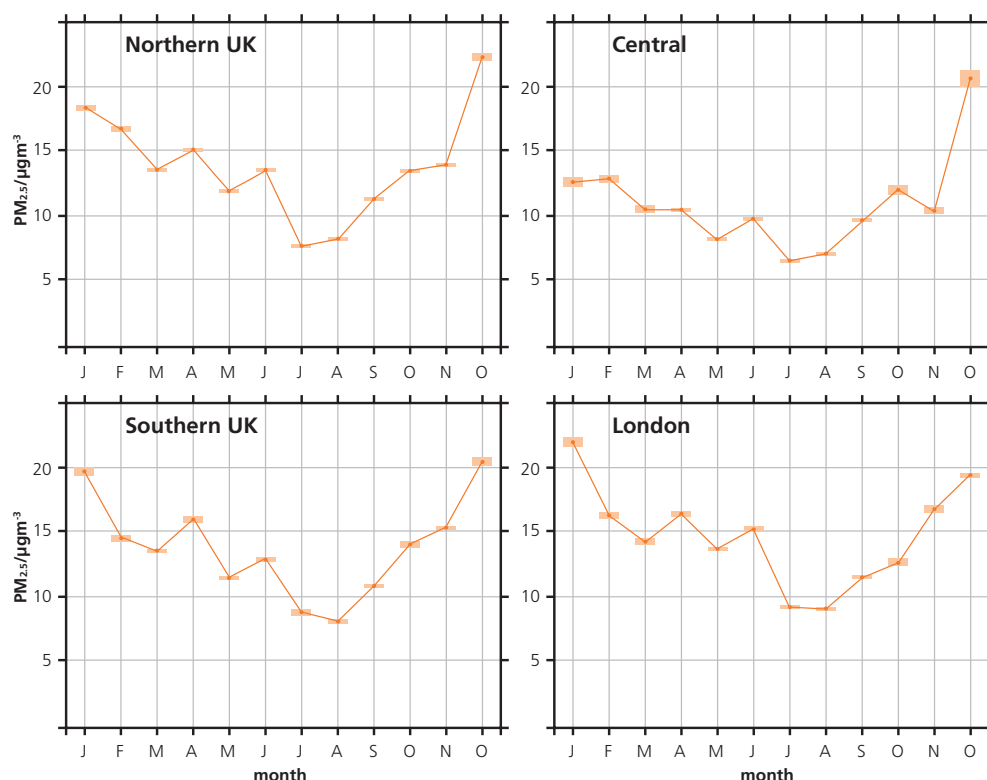


### 3.2.4 Seasonal variations in PM<sub>2.5</sub> at urban background sites

9. The pattern of PM<sub>2.5</sub> concentrations by month of the year is summarised in Figure 3.5 for urban background sites in four geographic areas of the UK. The pattern during 2010 was broadly similar at all sites (and at roadside and industrial sites, not shown), with the concentrations declining steadily from January through to a minimum in July/August, before rising again to December. This is broadly similar to the pattern seen in 2009, although the highest concentrations in 2009 were in January not December (as was also the case in London in 2010) (Laxen *et al.*, 2010). The patterns seen relate to greater emissions of both primary PM and secondary PM precursors during the winter, due to the higher heating load, as well as to the reduced dispersion of local sources during the winter period. It will also relate, in part, to the loss of semi-volatile PM during summer months, which will be less prevalent during winter months. The range of monthly means is substantial, from 6 to 21  $\mu\text{g m}^{-3}$  in northern UK, from 8 to 22  $\mu\text{g m}^{-3}$  in central UK, from 9 to 20  $\mu\text{g m}^{-3}$  in southern UK and from 9 to 22  $\mu\text{g m}^{-3}$  in London. The particularly high monthly mean for December 2010 in the central and northern parts of the UK coincided with the coldest December for a number of years, particularly in Scotland, which will have contributed to additional heating loads and associated PM emissions. **It is clear that wintertime concentrations will make the greatest contribution to the annual mean; it may thus be more effective to target measures at those sources contributing to the elevated wintertime concentrations.**



**Figure 3.5:** Variation of PM<sub>2.5</sub> concentrations ( $\mu\text{g m}^{-3}$ ) at urban background sites by month of the year in 2010 at sites in northern UK (n=6), central UK (n=17), southern UK (n=10) and London (n=8). The shading represents the 95% confidence interval of the mean.