ENSO Modulation of Auckland, New Zealand Pollen Season

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Abstract:

ENSO cycle influence on seasonal variability in allergy-triggering pollen is unknown, despite high potential. We compare grass pollen seasons between the major modes of the ENSO cycle in Auckland. We find no clear difference in the timing of onset of the pollen seasons, but season length was longer, by >30 days, during both El Niño phases than during the La Niña phase. Severity of the La Niña pollen season was also lower. These differences are explained by the greater summer rainfall typically experienced in Auckland and elsewhere in northern New Zealand during La Niña phases, which tends to suppress grass pollen production and dispersal. As grass pollen is the principal source of allergenic pollen in New Zealand and in many other countries, these results have wider implications for allergy management. As ENSO forecasting can be useful with several months of lead time, there is potential for improving community preparedness and resilience to inter-annual dynamics of the grass pollen season. However, the strong geographical heterogeneity in ENSO cycle climate impacts necessitates a region-specific approach. This work underscores the need for local-regional pollen monitoring in NZ and the risk of relying upon static, nationwide pollen calendars for informing allergy treatment.