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Title

Combinations of multimorbidity & risk of hospitalisation or death in England during the winter season: population-based study

Priority 1 (Research Category)

Multimorbidity

Presenters

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Abstract

Context: The annual winter season poses substantial challenges to the NHS in England. Those with multiple long-term conditions (MLTC) are more likely to be admitted to hospitals and/or die during this period, yet no research has examined which combinations of conditions are related to death or hospitalisation during the winter season.

Objective: To describe which combinations of long-term conditions (LTC) are associated with a higher risk of death & hospitalisation during winter amongst adults with MLTC in England.

Study Design & Analysis: In this population-based study, we used linked primary and secondary care data used over dispersed Poisson regression models to estimate the incidence rate ratios of all-cause hospitalisations and deaths during the winter season (1st December 2021 to 31st March 2022) associated with combinations MLTC, compared to those with no LTC.

Setting/Dataset: General Practice Extraction Service Data for pandemic planning (GDPPR) database, Hospital Episode Statistics, & Office for National Statistics death registry identified 10 combinations of MLTC most commonly associated with hospital admission or death during the winter season.

Population Studied: All individuals registered in GDPPR with complete sociodemographic variables, alive at our study start date were alive & aged ≥18 years on 1st December 2021.

Intervention/Instrument: Data analysis were performed using Python (version 3.7) and Spark SQL (version 2.4.5) on Databricks (version 6.4). Statistical analysis was conducted in R (version 4.0.3).

Outcome Measures: Total number of all-cause hospital admissions (from HES APC) & deaths (from ONS deaths registry) during the winter season by MLTC per 1000 person-years.

Results: Complete data were available for 48,253,125 individuals; 15 million (31.2%) had a MLTC. Hospitalisation rate per 1000 person-years was higher amongst people with MLTC, varying by combinations of conditions. There were 96/1000 person-years in those with no LTC vs 1643/1000 amongst those with a combination of cancer, chronic kidney disease (CKD), cardiovascular disease (CVD) & diabetes mellitus. The incidence rate of death was 345/1000 person-years among those with cancer+CKD+CVD+dementia compared with 1/1000- person-years among those with no LTC.

Conclusions: Hospitalisation & death vary by combinations of MLTC. High-risk combinations need prioritisation & preventive action by clinicians & policy makers to manage winter pressures on the NHS.