

Appendix 2 (as supplied by the authors): Method of calculation for adjusted proportions due to multimorbidity, mental disorders, and synergy

We estimated numbers of admissions due to multimorbidity, mental disorders, and synergy as follows (1). We first used the frequent ED use proportion among people with no mental or physical illnesses as a background proportion (P_b), explained by factors other than physical or mental disorders. Next, we subtracted the background proportion from the frequent ED use proportions in each multimorbidity category (1, 2, 3, and ≥ 4 illnesses) without mental disorders to estimate risk from physical multimorbidity alone (P_p). Similarly, we subtracted the background proportion from the adjusted proportion of frequent ED users with mental disorders but no physical illness to estimate the proportion due to mental disorders alone (P_m). Finally, we obtained proportions due to synergy at each combination of multimorbidity and mental disorders using the formula: $P_s = P - P_b - P_p - P_m$. We then multiplied these proportions by the actual number of admissions observed at each combination of multimorbidity and mental disorders to estimate the number of admissions due to each factor.

Reference

1. VanderWeele TJ, Knol MJ. A tutorial on interaction. *Epidemiol Methods* 2014;3:33-72.