Title: Prevalence of multimorbidity in people living with and without severe mental illness: a systematic review and meta-analysis

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Abstract:

Background:

People with severe mental illness (SMI), specifically schizophrenia-spectrum disorder (SSD) and bipolar disorder (BD), face poorer health outcomes from multiple chronic illnesses. Physical multimorbidity, the coexistence of two or more chronic physical conditions, and psychiatric multimorbidity, the coexistence of three or more psychiatric disorders, are both emerging concepts useful in conceptualising disease burden. However, the prevalence of physical and psychiatric multimorbidity in this cohort is unknown.

Methods:

We searched CINAHL, EMBASE, PubMed, and PsycINFO from inception until 15/02/2024 for observational studies that measured multimorbidity prevalence. From control studies, a random-effects meta-analysis compared odds of physical multimorbidity between people with and without SMI. Absolute prevalence of physical and psychiatric multimorbidity in people with SMI was also calculated. Sensitivity and meta-regression analyses tested an array of demographic, diagnostic, and methodological variables.

Results:

From 11144 citations we included 82 observational studies featuring 1623773individuals with SMI (specifically SSD or BD), of which 21 studies featured 13235882 control individuals without SMI. The odds ratio (OR) of physical multimorbidity between people with and without SMI was 2.40 (k=11, 95%CI=1.57–3.65, *p*=0.0009). This ratio was accentuated in younger SMI populations (mean age≤40years, OR=3.99, 95%CI=1.43–11.10), compared to older populations (mean age>40years, OR=1.55, 95%CI=0.96–2.51; subgroup differences *p*=0.0013). For absolute prevalence, 25% of those with SMI have physical multimorbidity (k=29, 95%CI=0.19–0.32) and 14% have psychiatric multimorbidity (k=21, 95%CI=0.08–0.23).

Conclusions:

This is the first meta-analysis to estimate physical alongside psychiatric multimorbidity prevalence, demonstrating that these are common in people with SSD and BD. The greater burden of physical multimorbidity in people with SMI compared to those without is potentially magnified for younger cohorts, reflecting a need for earlier intervention. Our

findings speak to the utility of multimorbidity for characterising the disease burden associated with SMI, and the importance of facilitating integrated physical and mental healthcare.

Research in Context Section:

Evidence before this study

A key driver of the significantly poorer health outcomes faced by those living with severe mental illness is the presence of multiple physical and psychiatric conditions. Whilst the concept of comorbidity has previously been investigated in this cohort to examine specific pairs of conditions (e.g., schizophrenia and diabetes mellitus), multimorbidity, which refers to the presence of two or more concurrent chronic conditions, is yet to be thoroughly investigated with respect to its prevalence amongst those living with severe mental illness. Moreover, existing multimorbidity studies have been limited to either physical or psychiatric multimorbidity, but not both. We performed a systematic search of CINAHL, EMBASE, PubMed, and PsycINFO to identify studies published in any language from inception to February 15th 2024 that had measured prevalence of physical and psychiatric multimorbidity in those living with severe mental illness, with or without general population controls. From the collated case-control data, we calculated the odds ratio of physical multimorbidity between cohorts with and without severe mental illness; from all included studies we also estimated the absolute prevalence of physical and psychiatric multimorbidity in the cohort with severe mental illness.

Added value of this study

Our meta-analysis is the first to have estimated the prevalence of both physical and psychiatric multimorbidity in those with severe mental illness. Our estimate that people with severe mental illness have over twice the odds of physical multimorbidity compared to those without highlights the greater burden of disease in this cohort, and stratifying this analysis by mean age demonstrated a widened prevalence gap for younger people with SMI. Our estimates that one in four people with severe mental illness have physical multimorbidity and one in seven have psychiatric multimorbidity testify that having multiple chronic conditions is a common public health issue within this cohort.

Implications of all the available evidence

This research emphasises the utility of multimorbidity in characterising the chronic disease burden faced by people living with severe mental illness, which has historically only been examined through a dichotomous comorbidity lens. Estimating the prevalence of multimorbidity is the first step in understanding how multimorbidity impacts function, quality of life and mortality in this cohort, which is a prerequisite for future research that addresses its prevention and management. The high prevalence of multimorbidity demonstrated here constitutes a call to arms, highlighting the need for integrated health services that facilitate both physical and mental healthcare.

Introduction:

People living with severe mental illness (SMI), such as schizophrenia-spectrum disorder (SSD) and bipolar disorder (BD), face disproportionate adverse health outcomes, previously summarised as the "three D's" of *Death*, *Disability*, and *health-economic Deficit*.[1] SMI is associated with a significantly reduced life expectancy,[2-5] and SMI conditions are leading causes of disability globally and have substantial healthcare costs. [6-10] The presence of additional chronic conditions, both physical and psychiatric, has been proposed as a key driver of these adverse health outcomes.[5,7,8,11]

Multimorbidity is an emerging concept that represents the concurrent presence of two or more chronic conditions in an individual.[12,13] Whilst comorbidity generally indicates the presence of another specific condition, e.g., diabetes mellitus, in reference to an index condition, e.g., schizophrenia,[14] multimorbidity is posited as a more broad, holistic, and patient-centred framework that aims to conceptualise the number and types of conditions an individual has.[12,15] Whilst comorbidity is a disease-focussed concept that examines specific pairs of conditions, multimorbidity is more concerned with the heterogeneity and complexity of the multiple health conditions that individuals with SSD or BD live with. In the literature, multimorbidity is also discussed within the subdomains of physical multimorbidity,[16] denoting multiple chronic physical conditions, and psychiatric multimorbidity, signifying multiple psychiatric conditions.[17]

Whilst the risk of specific singular comorbidities has been studied for different mental disorders,[18,19] the prevalence of having physical or psychiatric multimorbidity is largely unelucidated. Exploring the latter is necessary to contextualise the burden of complexity attributable to multiple illnesses that is experienced by this cohort, and further address the misconception that additional illnesses exist only as singular entities.

Whilst originally intended for ageing populations,[20] multimorbidity is an emerging applicable concept to frame the holistic health needs of people with SSD or BD.[1] One systematic review to date has examined physical multimorbidity in those with SSD,[21] and another in a general SMI cohort,[22] however no reviews have examined the concept in BD; psychiatric multimorbidity has not been estimated in either cohort. Clinical recognition of

multimorbidity will enable clinicians to progress towards patient-centred care that advocates for integrated treatment of physical and mental health instead of siloed interventions for different concurrent chronic pathologies.[1] As a prerequisite to developing integrated care models, clarification of the epidemiology of multimorbidity is needed.

This systematic review and meta-analysis aims to (i) compare the prevalence of physical multimorbidity between cohorts with and without severe mental illness (SMI), which will be used hereafter as a collective term for people with either SSD or BD, and (ii) estimate the absolute prevalence of both physical and psychiatric multimorbidity in people with SMI.

The authors acknowledge that SMI is a heterogenous term that elsewhere has encompassed other mental disorders, such as severe depression; in order to maintain a feasible scope for this review, only SSD and BD were examined.

Methods:

This systematic review was registered on PROSPERO (CRD42023395223) and conducted as per PRISMA guidelines (Appendix pg.90-91).[23]

A systematic search was undertaken in CINAHL, EMBASE, PubMed, and PsycINFO comprising search terms relating to the population (SMI) and outcome (multimorbidity; full search strategy in Appendix pg.3). The search was first run on 29 January 2023 to identify studies published from inception until then; the search was re-run on 15 February 2024 for studies published since. No language restrictions were applied and *Microsoft Word* translation software was used for studies published not in English. Retrieved titles and abstracts were screened independently by two authors (SH, CC); abstracts marked for inclusion by either author were screened at full-text similarly (SH, CC) with conflicts resolved by consensus.

Studies were scrutinised on these inclusion criteria: (i) an observational study design (cross-sectional, case-control, and cohort studies; experimental studies with observational baseline data were also included); (ii) a population consisting primarily of adults (mean age ≥18) diagnosed with either SSD or BD; and (iii) a measurement of occurrence of either physical multimorbidity (≥2 physical health conditions) or psychiatric multimorbidity (≥3 psychiatric

conditions total, including the SMI). In order to account for the variability in SMI diagnoses, adults with both schizophrenia and other related schizophrenia-spectrum disorders (e.g., schizoaffective disorder) were included under the SSD umbrella, and adults with either type I, II, or unspecified bipolar illness were included under BD. A control population without any psychiatric illness was desired but not essential. Articles that featured a mixed psychiatric population with other diagnoses were excluded; whilst it is acknowledged that conditions other than SSD and BD can have severe manifestations, these two diagnostic groups are most frequently synonymous with SMI in the literature.[24,25] Articles that did not report multimorbidity outcome data in text or appendices were excluded; unpublished studies, studies with missing data, and grey literature were not sought. Articles that reported on a population already reported elsewhere or suspected to have included the same sample were excluded unless unique outcome data was presented. When scrutinising two studies with the same populations and outcomes, the study with the largest sample was included.

Data were independently extracted by two authors (SH, CC) with discrepancies resolved by reviewing the full-text. Extracted outcome data were prevalence proportions of physical multimorbidity and psychiatric multimorbidity, as well as mean number of conditions if available. Graphical data was extracted with the online tool *Web Plot Digitizer*.[26]

Demographic variables extracted included age, sex, ethnicity, study location, sample type, and diagnostic composition (SSD, BD, or mixed cohort). Study information collected included study design and presence of control (with associated demographic information). Covariates that were insufficiently reported that were originally planned to be extracted (e.g., smoking) are discussed in the Appendix (pg.5).

An adapted seven-item critical appraisal tool from the Joanna Briggs Institute (JBI) for cross-sectional designs was used to assess all included studies with reference to how prevalence of multimorbidity was measured cross-sectionally (Appendix pg.7).[27] For the subset of studies with case-control measurements, a nine-item adapted (Appendix pg.7) case-control tool from JBI was applied.[27]

Statistical Analysis

To evaluate multimorbidity burden, a series of meta-analyses were performed in R Studio (version 2023.09.0+463) with the *meta* package. Cochrane formulae for pooling stratified mean and SD values were applied as required (e.g., to calculate pooled mean age) (Appendix, pg.6).[28]For the primary outcome, prevalence odds ratio (OR) between those with and without SMI was estimated using the *metabin* command with random-effects. This was calculated only for physical multimorbidity from the subset of studies with case-control cross-sectional data. The Hartung-Knapp modification was applied in consideration of analyses with few (≤5) studies.[29] Heterogeneity and total variance were investigated with I^2 and τ^2. Small-study effect bias was investigated with visual inspection of funnel plots and Egger's regression test. Leave-one-out analysis was undertaken to test whether individual studies biased overall effect estimates and heterogeneity.

As a secondary outcome, the *metaprop* command was used to estimate absolute prevalence of physical and psychiatric multimorbidity individually in those with SMI from all studies with cross-sectional data. We measured prevalence estimates for two different thresholds of multimorbidity: ≥2 and ≥3 chronic conditions (or ≥3 or ≥4 psychiatric conditions for psychiatric multimorbidity). A generalised linear mixed-effects model was used with logit transformed values for pooled proportion;[30] this model was compared with results obtained from pooling raw prevalence values. Heterogeneity was examined as above.

Both sets of above analyses were conducted in diagnostic subgroups (SSD and BD).

Sensitivity and meta-regression analyses were used to investigate the impact of covariates. Categorical variables studied in the sensitivity analyses included age stratified cohorts (mean age ≤40 and >40 years), study continent, study sample type, and study design. Continuous variables investigated through meta-regression (supplementary methods, Appendix pg.6) included mean age, sex ratio (females: males), ethnicity (proportion of population with White ethnicity), study publication year, study quality index, and country GDP (log-transformed).

Results:

The systematic search strategy retrieved 11144 unique records (10219 from original search, 925 additional from re-run search) and 82 articles (80 in English, 1 in Czech, 1 in Turkish) were marked for inclusion (Figure 1, Appendix pg.32).

This review featured 1623773 individuals with and 13235882 individuals without SMI. The SMI cohort included a subgroup of 1223561 with SSD and 318585 with BD; a small number of studies included a mixed SMI cohort with no stratified data (Table 1). Of the 75 studies contributing unique individuals, 32 studies featured a population-based cohort and 43 featured a selective sample derived from clinical populations. 1601840 individuals (98.6% of total) were from population-based studies.

The mean age of the pooled SMI population was 47.9±16.1years and ratio of females to males was 37%:63%. For demographic variables such as age, sex, and especially ethnicity, there was inconsistent reporting throughout included studies. Hence, the pooled averages have been calculated only for the studies that reported said variables and are not accurate representations of the entire cohort.

29% of studies reported ethnicity data; of these, 69% of this pooled cohort were of White backgrounds and 31% were of other ethnic backgrounds; specific proportions were not able to be estimated for other ethnicities given lack of reported data. A majority of studies were located in North America (40%), followed by Europe (33%) and Asia (19%).

Regarding methodological quality, 21, 33, and 28 studies were of low, average, and high quality respectively (Appendix pg.37). Weaker domains on average concerned reporting of population demographics, reporting of outcome methodology, and handling of covariates. The 21 studies that contained control groups were also assessed on aspects related to case-control methodology (Appendix pg.38); five, fourteen, and two studies were of low, average, and high case-control quality respectively. In general, comparability between cases and control and matching methods were either not explicit or handled poorly. However,

cases and controls were found to be mostly comparable in age and sex for the subset of meta-analyses that compared them (Appendix pg.64-65).

80 of the 82 included studies were included in various meta-analyses and had measured prevalence of multimorbidity. Two studies which had instead measured incidence of multimorbidity did not have data that could be incorporated into meta-analyses. Few studies explicitly used the term 'multimorbidity'; the majority of studies used variations of terms such as 'comorbidity' e.g., multiple comorbidities (Appendix, pg.41-44).

54 studies had measured physical multimorbidity; cardiovascular, endocrine, neurological, and respiratory conditions were the most common types of conditions included within study-specific (>80% of included studies) multimorbidity matrices (Appendix, pg.41-43). 23 studies had measured psychiatric multimorbidity; within study-specific psychiatric multimorbidity definitions, 83% of studies included anxiety disorders and 74% included substance use disorders as the most commonly examined additional conditions (Appendix, pg.44).

In comparison to a control cohort without SMI, the odds of physical multimorbidity at a threshold of ≥2 conditions (Figure 2A) in those with SMI was 2.40 times greater (n_{SMI}/ $n_{Control}$=116812/5204184, k=11, 95%CI=1.57–3.65, *p*=0.0009). Upon stratification by mean age, three studies with a mean age of ≤40 had a magnified pooled OR of 3.99 (95%CI=1.43–11.10) compared against an OR of 1.55 for studies with a mean age of >40 (k=5, 95%CI=0.96–2.51; between subgroup differences: *p*=0.0013) (Appendix pg.67).

When stratified by diagnosis, the OR for the BD only comparison was 3.20 (n_{BD}/ $n_{Control}$=43750/2461911, k=5, 95%CI=1.65–6.22, *p*=0.0082; Figure 2D), whilst the SSD only comparison had an OR of 2.16 (n_{SSD}/$n_{Control}$=68716/4852351, k=9, 95%CI=1.30–3.60, *p*=0.0082; Figure 2C). When restricted to combined SSD and BD cohorts, an intermediate pooled OR was observed (OR=2.76, 95%CI=1.36–5.60, *p*=0.016).

The OR for physical multimorbidity at a threshold of ≥3 conditions (Appendix pg.60) between those with and without SMI was 1.97 ($n_{SMI}/n_{Control}$=230354/6889649, k=8, 95%CI=1.13–3.42, *p*=0.023).

Regarding absolute prevalence in those with SMI, logit-transformed meta-analysis of physical multimorbidity (≥2 physical conditions) (Figure 3A) yielded a pooled prevalence value of 25% (n=995742, k=29, 95%CI=0.19–0.32). People with SSD only and BD only had a pooled physical multimorbidity prevalence of 25% (n=757996, k=22, 95%CI=0.19–0.32, Figure 3C) and 29% (n=242098, k=14, 95%CI=0.20–0.41, Figure 3D) respectively.

Prevalence of physical multimorbidity at the threshold of ≥3 physical conditions (Appendix pg.53) for those with SMI was 13% (n=906076, k=27, 95%CI=0.09–0.18). Of studies that reported number of physical conditions, meta-analysis demonstrated a pooled mean of 1.41 conditions (k=26, 95%CI=1.08–1.73) for those with SMI (Appendix pg.62-63).

Psychiatric multimorbidity (≥3 psychiatric conditions, including SMI), had a pooled prevalence of 14% (n=78705, k=21, 95%CI=0.08–0.23) for SMI generally (Figure 4A). When stratified (Figures 4C-D), psychiatric multimorbidity had a higher prevalence in cohorts with BD, with a pooled value of 22% (n=71947, k=14, 95%CI=0.13–0.34), compared to a pooled value of 10% for SSD (n=6629, k=9, 95%CI=0.03–0.26).

The few clinically meaningful covariates and effect-modifiers identified through sensitivity and meta-regression analyses pertained to study continent and whether current or lifetime diagnoses constituted multimorbidity, in addition to mean age stratification as discussed above (Appendix pg.64-82, 116-132).

Studies outside of North America and Europe had a higher odds ratio (OR=4.27, k=4, 95%CI=2.45–7.44) compared to North America (OR=2.37, k=2, 95%CI=0.00–3151.6) and Europe (OR=1.55, k=5, 95%CI=0.96–2.51; between subgroup differences *p*<0.0001; Appendix pg.69). Meta-regression by country GDP (using package *gapminder*) did not demonstrate any broad trends (Appendix pg.74,81,88).

Restricting psychiatric multimorbidity, but not physical multimorbidity, to only current diagnoses yielded a lower absolute prevalence of 8.4% (k=8, 95%CI=0.04–0.18), versus 23.4% when including lifetime diagnoses (k=11, 95%CI=0.13–0.39; between subgroup differences *p*=0.039) (Appendix pg.83).

Heterogeneity was consistently high (I^2>90%). This is speculated to be partially driven by variability in how multimorbidity was measured (Appendix pg. 41-44). Because of heterogeneity, publication bias assessments had limited capacity; Egger's regression tests demonstrated insignificant p-values for small-study effect bias across the meta-analyses for physical multimorbidity (Appendix pg.89). Psychiatric multimorbidity had significant Egger's regression p-values, potentially secondary to small-study bias (Appendix pg.89). Leave-one-out analysis demonstrated relatively stable overall results when omitting individual studies (Appendix pg.92-115).

Discussion:

Compared to those without, people with SMI had over twice the odds of having physical multimorbidity. Furthermore, we observed that 25% of those with SMI experience physical multimorbidity and 14% experience psychiatric multimorbidity cross-sectionally. Our findings attest to the inequity of complex chronic disease burden in people with SMI.

The only previous meta-analysis to have estimated the prevalence of physical multimorbidity in people with SSD estimated an absolute prevalence of 43% (k=13, n=211093, 95%CI=0.25–0.60).[21] Whilst comparable, our more modest estimate for the SSD subgroup was supported by a larger pooled sample (k=22, n=757996). Another smaller meta-analysis demonstrated a more modest odds ratio of physical multimorbidity between those with and without SMI (OR=1.84, $n_{SMI}/n_{Control}$ not reported, k=4, 95%CI=1.33–2.54).[22] No previous meta-analysis has measured psychiatric multimorbidity in SMI, nor has physical multimorbidity been estimated in BD.

Several of the included studies here individually demonstrated the impact of age, with younger SMI cohorts having a greater prevalence of physical multimorbidity compared to control cohorts;[35-37] this trend was similarly demonstrated in our sensitivity analysis. We

speculate that those with SMI experience a disproportionate burden of physical multimorbidity at younger ages, and consequently may experience a greater lifetime exposure to poor physical health which we previously hypothesised to be a driver for adverse health outcomes, such as premature mortality.[1] These findings also signal a need for multimorbidity to be curbed through early intervention.

Physical multimorbidity was prevalent at a similar proportions in both SSD and BD. The similar estimates coincide with the established risk that mental illness has on the development of physical illness,[18] a relationship which appears general rather than specific to particular disorders. The mechanisms underlying why those with SMI may be prone to physical multimorbidity at younger ages are multitudinous, comprising a nuanced combination of non-modifiable (e.g., genetic, prenatal, sociocultural factors),[38-40] and modifiable risk factors (e.g. lifestyle factors, choice of psychotropic medication) that appear broadly shared across both SSD and BD.[24] Whilst it is beyond the scope of this study, some differences between diagnostic cohorts may result from the distinct physical side-effect profiles of respective psychiatric medications, such as lithium's impacts on thyroid and renal function.[24]

Additional psychiatric illness is speculated to further exacerbate these mechanisms, particularly with respect to diagnostic overshadowing.[1,41] Our finding that psychiatric multimorbidity is relatively common in people with SMI is in keeping with existing large cohort data, such as national Danish register data which has highlighted the pervasive risk that one psychiatric disorder has on development of a subsequent.[19]

Regarding recognition of multimorbidity, despite many of the studies having measured multimorbidity, few labelled it explicitly as such. Moreover, there was an apparent imbalance in the types of systems and conditions included within study-specific multimorbidity matrices. Physical multimorbidity studies frequently examined cardiovascular, endocrine, and neurological conditions; this may be in part due to these systems being more frequently associated with SMI given the physical side-effects of antipsychotics. Conversely, renal, gastrointestinal, malignancy, musculoskeletal, and infectious disorders were more infrequently included. Studies that examined psychiatric

multimorbidity were biased towards anxiety and substance use disorders. Interestingly, physical multimorbidity studies more commonly featured people with SSD, whilst psychiatric multimorbidity was more frequently examined in those with BD, which may reflect an inherent bias in the literature between diagnostic groups.

Given its prevalence, there is a need for multimorbidity to be translated to interventional research. The presence of an additional physical or psychiatric condition is frequently an exclusion criterion for inclusion in randomised-controlled trials.[42] Consequently, treatment guidelines informed by interventional studies often assume a single disease model of care, which is not generalisable to the substantial number of people living with SMI and multimorbidity. Moreover, whilst treatment of physical and mental health remains siloed in many health services globally, the high prevalence of physical multimorbidity attests to the urgent need for integrated care models that address both physical and mental health outcomes in people with SMI.[24,43] Ideally, a multidisciplinary multimorbidity model of care for those with SMI, hallmarked by shared treatment planning between practitioners, rationalised medication usage, and structured non-pharmacological interventions that address pervasive modifiable risk factors such as smoking, diet, and exercise should be offered. [1]

There are several limitations of note. Several analyses, particularly when analysing specific diagnostic subgroups, had fewer included studies; inaccurate between-study heterogeneity estimates are suspected to have been introduced in such cases. Lack of population weights for the pooled proportion analyses also stands as a limitation. Meta-analyses with fewer studies were prone to imprecise confidence interval ranges which may have led to sparse-data bias.

Several important covariates could not be controlled for due to inadequate data availability, such as smoking rates, symptom severity, and medication status. Mixed reporting of covariates (e.g., age) limited the strength of our existing sensitivity and meta-regression analyses, and unmeasured confounding stands as a limitation.

As a majority of included studies were from North America and Europe, the meta-analytic estimates may not be generalisable to other settings. Reporting on ethnicity was also inconsistent, which constitutes a considerable gap given the differential burden of multimorbidity previously demonstrated between ethnically and culturally diverse groups.[44] As a lack of explicit data was available on access to interventions, such as early intervention services, this review is unable to explicitly comment on how multimorbidity might vary between differentially treated populations.

Incidence of multimorbidity in those with SMI was not measured here due to a paucity of primary data, but is nevertheless important in complementing estimates of prevalence. Information on the incidence rates of psychiatric multimorbidity amongst those with SMI is also required, especially for guiding early intervention services. Further studies which review types and clustering of conditions in multimorbidity are needed for granular clarity; demarcating what specific conditions are included in study-specific multimorbidity definitions should be a priority of future studies to ensure transparency.

Concerning the overall quality of the body of evidence, there was a mixed range of quality across the included studies based upon the study-specific risk of bias ratings, although, study quality criteria as categorical variables and an overall quantitative index did not appear to impact sensitivity and meta-regression analyses respectively. Inconsistency was significant throughout all analyses, as given by the extensive heterogeneity; this is speculated to be attributed to the range of study-specific definitions and conditions included within multimorbidity matrices such as whether current or lifetime conditions were included. This speaks to the marked indirectness inherent in attempts to synthesise the available evidence (Appendix pg.41-44). As a strength against imprecision, clinically meaningful confidence intervals could be estimated from the available studies, as powered by the large available sample size. Whilst publication bias was largely not indicated by the Egger's regression tests, not including grey literature and studies with missing data represent sources of potential publication bias. Overall, these meta-analyses facilitated estimation of general prevalence estimates, however the results should be taken with caution given concerns for inconsistency and indirectness.

Conclusion:

Our study demonstrates that physical multimorbidity manifests with over twice the odds in those with SMI compared to those without. Whilst health services and treatment guidelines often operate on the assumption that individuals have a single principal diagnosis, these results attest to the clinical complexity many people living with SMI face in relation to burden of chronic disease. Further understanding of the epidemiological manifestations of multimorbidity in this cohort, with regards to incidence and clustering, is an imperative. Such understanding can enable the formulation of holistic prevention and management strategies that aim to mitigate the catalyst role that multimorbidity plays in exacerbating the health inequities faced by this already vulnerable cohort.

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