TECHNICAL COMMENTARY

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Worldwide prevalence

Introduction

Prevalence quantifies the proportion of individuals in a population who have a disease during a specific time period, while incidence refers to the number of new cases of disease that develop in a population during a specific time period. In disorders of short duration, incidence and prevalence rates may be similar, however with disorders of long duration such as with schizophrenia there can be variation between the two. Point prevalence is the proportion of individuals who manifest a disorder at a given point in time, period measures the proportion of individuals who manifest a disorder during a specified period (e.g. 1 year), lifetime is the proportion of individuals in the population who have ever manifested a disorder who are alive on a given day, and lifetime morbid risk also includes those deceased at the time of the survey.

Method

We have included only systematic reviews with detailed literature search, methodology, and inclusion/exclusion criteria that were published in full text, in English, from the year 2000. Reviews were identified by searching the databases MEDLINE, EMBASE, and PsycINFO. Reviews with pooled data are prioritized for inclusion. Reviews reporting fewer than 50% of items on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA[1]) checklist have been excluded from the library. The evidence was graded guided by the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group approach[2]. The resulting table represents an objective summary of the available evidence, although the conclusions are solely the opinion of staff of NeuRA (Neuroscience Research Australia).

Results

We found four systematic reviews that met our inclusion criteria[3-6].

- Moderate to high quality evidence suggests worldwide prevalence for any non-affective psychotic disorder is 0.40% for one year prevalence and 0.75% for lifetime prevalence. For schizophrenia specifically, point prevalence was around 0.42%, one year prevalence was around 0.30%, lifetime prevalence was around 0.50%, and lifetime morbid risk prevalence was around 0.72%.
- Lifetime prevalence rates were higher in cohort studies than in cross-sectional studies, higher in studies from Europe than in studies from North America, higher in more recent studies than in older studies, and higher in lower quality studies than in higher quality studies. These variances in lifetime prevalence rates were similar for 12-month prevalence rates, apart from North American studies finding higher 12-month prevalence rates than European studies.
- High quality evidence suggests the worldwide, *age-standardised* point prevalence in 2016 was 0.28%. This rate was similar in males and females, across regions, and over time (1990 to 2016), although the number of cases increased over time (13 million to 21 million) due to population growth.

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Charlson FJ, Ferrari AJ, Santomauro DF, Diminic S, Stockings E, Scott JG, McGrath JJ, Whiteford HA

Global Epidemiology and Burden of Schizophrenia: Findings From the Global Burden of Disease Study 2016

Schizophrenia Bulletin 2018; 44: 1195-203

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Comparison	**Worldwide prevalence of schizophrenia.**
Summary of evidence	**High quality evidence (very large samples, appears precise, direct) suggests worldwide, age-standardised point prevalence in 2016 was 0.28%. This rate was similar in males and females, across regions, and over time (1990 to 2016), although the number of cases increased over time (13 to 21 million) due to population growth.**
Prevalence of schizophrenia	
129 population-level studies *The global age-standardised point prevalence in 2016;* 0.28%, 95%UI 0.24% to 0.31% There were no major differences in the age-standardised point prevalence according to sex or across countries/regions, nor between 1990 and 2016. However, the prevalence of cases each year increased from 13 million in 1990 to 21 million in 2016, as a result of population growth. Authors report that schizophrenia contributes 13.4 (95%UI 9.9 to 16.7) million years of life lived with disability to the burden of global disease. Both prevalence and disease burden peaked around 30 to 40 years of age.	
Consistency in results‡	Variances in individual study results were partly explained by mean study age; results were adjusted for age.
Precision in results§	Appears precise.
Directness of results‖	Direct

Moreno-Kustner B, Martin C, Pastor L

Prevalence of psychotic disorders and its association with methodological

issues. A systematic review and meta-analyses **PLoS ONE 2018; 13(4): e0195687** View review abstract online	
Comparison	**Worldwide prevalence of schizophrenia and related psychotic disorders.**
Summary of evidence	**Moderate to high quality evidence (very large samples, unable to assess precision, direct) suggests worldwide prevalence for any non-affective psychotic disorder was between 0.40 per 100 for 1 year prevalence and 0.75 per 100 for lifetime prevalence. For schizophrenia specifically, point prevalence was around 0.42 per 100.**
Prevalence of schizophrenia and psychotic disorders	
Schizophrenia only Point prevalence = 49 population-level studies, median = 0.421 per 100 *All psychotic disorders* Point prevalence = 25 population-level studies, median = 0.389 per 100 1-year prevalence = 36 population-level studies, median = 0.403 per 100 Lifetime prevalence = 28 population-level studies, median = 0.749 per 100 *All schizophrenia spectrum disorders* Point prevalence = 15 population-level studies, median = 0.460 per 100 *Non-affective psychoses* Point prevalence = 30 population-level studies, median = 0.502 per 100 *Probable schizophrenia* Point prevalence = 7 population-level studies, median = 0.510 per 100 Higher study quality was associated with lower prevalence rates. Studies conducted in the general population reported higher prevalence rates than studies in health/social services.	
Consistency in results	Variances in study results were partly explained by study quality and the population assessed.
Precision in results	Unable to assess (no CIs).
Directness of results	Direct

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Saha S, Chant D, Welham J, McGrath J

A systematic review of the prevalence of schizophrenia

PLoS Medicine / Public Library of Science 2005; 2(5): e141

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Comparison	**Worldwide prevalence of schizophrenia.**
Summary of evidence	**Moderate to high quality evidence (very large samples, unable to assess precision, direct) suggests worldwide prevalence varies between 3.3 per 1,000 for period prevalence and 4.6 per 1,000 for point prevalence, lifetime worldwide prevalence being around 4 per 1,000 and lifetime morbid risk being around 7.2 per 1,000.**
Prevalence of schizophrenia	
132 population-level studies Median non-specified prevalence = 2.7 per 1,000 (1.4 to 4.8) Median point prevalence (10% and 90% quantiles) = 4.6 per 1,000 (1.9 to 10.0) Median period (usually 1 year) prevalence = 3.3 per 1,000 (1.3 to 8.2) Median lifetime prevalence = 4.0 per 1,000 (1.8 to 11.6) Median lifetime morbid risk prevalence = 7.2 per 1,000 (3.1 to 27.1) Higher quality studies reported significantly higher prevalence estimates; $F_{1,105} = 4.79$, $p = 0.01$	
Consistency in results	Variances in study results were partly explained by study quality.
Precision in results	Unable to assess (no CIs; quantiles).
Directness of results	Direct

Simeone JC, Ward AJ, Rotella P, Collins J, Windisch R

An evaluation of variation in published estimates of schizophrenia prevalence from 1990–2013: a systematic literature review

BMC Psychiatry 2015; 15: 193

View review abstract online

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Comparison	Worldwide prevalence of schizophrenia.
Summary of evidence	**Moderate to high quality evidence (very large samples, unable to assess precision, direct) suggests median lifetime prevalence rates are around 0.48%, and median 12 month prevalence rates are around 0.33%. Median lifetime prevalence rates are higher in cohort studies than in cross-sectional studies, higher in studies from Europe than in studies from North America, higher in more recent studies than in older studies, and higher in lower quality studies than higher quality studies. These variances in lifetime prevalence rates are similar for 12 month prevalence rates, apart from North America reporting higher 12 month prevalence rates than Europe.**
Prevalence of schizophrenia	
Lifetime prevalence Median lifetime prevalence rate: 29 studies, 0.48%, IQR: 0.34% to 0.85% The median lifetime prevalence rate from cohort studies was higher than the rate from cross-sectional studies (12 cohort studies = 0.56%, 18 cross-sectional studies = 0.44%) The median lifetime prevalence rate varied across geographic regions; North America = 0.25% (3 studies), Europe = 0.52% (13 studies) The median lifetime prevalence rate varied according to time; < 1990 = 0.44% (10 studies), 1990 to 1999 = 0.40% (11 studies), and 2000 to 2009 = 0.70% (8 studies) The median lifetime prevalence rate varied according to study quality; low quality = 0.75% (7 studies), medium quality = 0.45% (10 studies), high quality = 0.47% (13 studies) *12-month prevalence* Median 12-month prevalence rate: 21 studies, 0.33%, IQR 0.26% to 0.51% The median 12-month prevalence rate from cohort studies was higher than the rate from cross-sectional studies (15 cohort studies = 0.40%, 6 cross-sectional studies = 0.30%) The median 12-month prevalence rate varied across geographic regions; Europe = 0.31% (10 studies), North America = 51% (5 studies), Oceania = 0.10% (1 study), and Africa = 0.75% (1 study) The median 12-month prevalence rate varied according to time; < 1990 = 0.33% (13 studies), 1990 to 1999 = 0.33% (23 studies), and 2000 to 2009 = 0.46% (25 studies) The median 12-month prevalence rate varied according to study quality; low quality = 0.42% (7 studies), medium quality = 0.31% (10 studies), high quality = 0.33% (4 studies) Authors report that prevalence within studies varied; age-adjusted estimates were higher than crude estimates by 17% to 138%, the use of a broader definition of schizophrenia spectrum disorders compared to schizophrenia increased case identification by 18% to 90%, identification of cases from inpatient-only settings versus any setting decreased prevalence by 60%, and no variation was reported according to differing diagnostic criteria.	

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Consistency in results	Variances between study results were partly explained by study design, geographic region, assessment time, and study qualit.
Precision in results	Unable to assess (no CIs)
Directness of results	Direct

Explanation of acronyms

F = F test for difference between groups, IQR = interquartile range, *p* = statistical probability of obtaining that result ($p < 0.05$ generally regarded as significant), UI = uncertainty interval

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Explanation of technical terms

* Bias has the potential to affect reviews of both RCT and observational studies. Forms of bias include; reporting bias – selective reporting of results, publication bias - trials that are not formally published tend to show less effect than published trials, further if there are statistically significant differences between groups in a trial, these trial results tend to get published before those of trials without significant differences; language bias – only including English language reports; funding bias - source of funding for the primary research with selective reporting of results within primary studies; outcome variable selection bias; database bias - including reports from some databases and not others; citation bias - preferential citation of authors. Trials can also be subject to bias when evaluators are not blind to treatment condition and selection bias of participants if trial samples are small[7].

† Different effect measures are reported by different reviews.

Prevalence refers to how many existing cases there are at a particular point in time. Incidence refers to how many new cases there are per population in a specified time period. Incidence is usually reported as the number of new cases per 100,000 people per year. Alternatively some studies present the number of new cases that have accumulated over several years against a person-years denominator. This denominator is the sum of individual units of time that the persons in the population are at risk of becoming a case. It takes into account the size of the underlying population sample and its age structure over the duration of observation.

Reliability and validity refers to how accurate the instrument is. Sensitivity is the proportion of actual positives that are correctly identified (100% sensitivity = correct identification of all actual positives) and specificity is the proportion of negatives that are correctly identified (100% specificity = not identifying anyone as positive if they are truly not).

Weighted mean difference scores refer to mean differences between treatment and comparison groups after treatment (or occasionally pre to post treatment) and in a randomised trial there is an assumption that both groups are comparable on this measure prior to treatment. Standardized mean differences are divided by the pooled standard deviation (or the standard deviation of one group when groups are homogenous) that allows results from different scales to be combined and compared. Each study's mean difference is then given a weighting depending on the size of the sample and the variability in the data. 0.2 represents a small effect, 0.5 a medium effect, and 0.8 and over represents a large effect[7].

Odds ratio (OR) or relative risk (RR) refers to the probability of a reduction (< 1) or an increase (> 1) in a particular outcome in a treatment group, or a group exposed to a risk factor, relative to the comparison group. For example, a RR of 0.75 translates to a reduction in risk of an outcome of 25% relative to those not receiving the treatment or not exposed to the risk factor. Conversely, a RR of 1.25 translates to an increased risk of 25% relative to those not receiving treatment or not having been exposed to a risk factor. A RR or OR of 1.00 means there is no difference between groups. A medium effect is considered if RR > 2 or < 0.5 and a large effect if RR > 5 or < 0.2[8]. lnOR stands for logarithmic OR where a lnOR of 0 shows no difference between groups. Hazard ratios

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measure the effect of an explanatory variable on the hazard or risk of an event.

Correlation coefficients (eg, r) indicate the strength of association or relationship between variables. They are an indication of prediction, but do not confirm causality due to possible and often unforseen confounding variables. An r of 0.10 represents a weak association, 0.25 a medium association and 0.40 and over represents a strong association. Unstandardised (b) regression coefficients indicate the average change in the dependent variable associated with a 1 unit change in the independent variable, statistically controlling for the other independent variables. Standardised regression coefficients represent the change being in units of standard deviations to allow comparison across different scales.

‡ Inconsistency refers to differing estimates of treatment effect across studies (i.e. heterogeneity or variability in results) that is not explained by subgroup analyses and therefore reduces confidence in the effect estimate. I^2 is the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance) - 0% to 40%: heterogeneity might not be important, 30% to 60%: may represent moderate heterogeneity, 50% to 90%: may represent substantial heterogeneity and over is considerable heterogeneity. I^2 can be calculated from Q (chi-square) for the test of heterogeneity with the following formula;

$$I^2 = \left(\frac{Q - df}{Q}\right) \times 100\%$$

§ Imprecision refers to wide confidence intervals indicating a lack of confidence in the effect estimate. Based on GRADE recommendations, a result for continuous data (standardised mean differences, not weighted mean differences) is considered imprecise if the upper or lower confidence limit crosses an effect size of 0.5 in either direction, and for binary and correlation data, an effect size of 0.25. GRADE also recommends downgrading the evidence when sample size is smaller than 300 (for binary data) and 400 (for continuous data), although for some topics, this criteria should be relaxed[9].

‖ Indirectness of comparison occurs when a comparison of intervention A versus B is not available but A was compared with C and B was compared with C that allows indirect comparisons of the magnitude of effect of A versus B. Indirectness of population, comparator and or outcome can also occur when the available evidence regarding a particular population, intervention, comparator, or outcome is not available so is inferred from available evidence. These inferred treatment effect sizes are of lower quality than those gained from head-to-head comparisons of A and B.

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