Prevalence of serious mental disorder in 7000 refugees resettled in western countries: a systematic review

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Summary

Background About 13 million people are classified as refugees worldwide, and many more former refugees have been granted citizenship in their new countries. However, the prevalence of post-traumatic stress disorder, major depression, or psychotic illnesses in these individuals is not known. We did a systematic review of surveys about these disorders in general refugee populations in western countries.

Methods We searched for psychiatric surveys that were based on interviews of unselected refugee populations and that included current diagnoses of post-traumatic stress disorder, major depression, psychotic illnesses, or generalised anxiety disorder. We did computer-assisted searches, scanned reference lists, searched journals, and corresponded with authors to determine prevalence rates of these mental disorders and to explore potential sources of heterogeneity, such as diagnostic criteria, sampling methods, and other characteristics.

Findings 20 eligible surveys provided results for 6743 adult refugees from seven countries, with substantial variation in assessment and sampling methods. In the larger studies, 9% (99% CI 8–10%) were diagnosed with post-traumatic stress disorder and 5% (4–6%) with major depression, with evidence of much psychiatric comorbidity. Five surveys of 260 refugee children from three countries yielded a prevalence of 11% (7–17%) for post-traumatic stress disorder. Larger and more rigorous surveys reported lower prevalence rates than did studies with less optimum designs, but heterogeneity persisted even in findings from the larger studies.

Interpretation Refugees resettled in western countries could be about ten times more likely to have post-traumatic stress disorder than age-matched general populations in those countries. Worldwide, tens of thousands of refugees and former refugees resettled in western countries probably have post-traumatic stress disorder.

Introduction

Worldwide, the number of refugees—defined narrowly by the refugee convention[1] as individuals who have been forcibly displaced outside their native countries—is estimated to be about 13 million[2] plus a much larger number of former refugees granted citizenship in their new countries. Refugees could be at excess risk of psychiatric morbidity because of forced migration, traumatic events, and resettlement in unfamiliar environments.[3] The relevant epidemiological evidence is, however, generally sparse, scattered, and apparently conflicting, and its interpretation has been complicated by the use of different sampling and assessment methods.[3] For example, estimates of the prevalence of post-traumatic stress disorder in adult refugees have ranged from 3%[4] to 86%[5] and those for major depression have ranged from 3%[6] to 80%.[5] There are concerns that selective citation of estimates at the lower end of this range have contributed to a neglect of refugee mental health, or conversely, that emphasis on estimates at the higher end have stigmatised refugees and given rise to inappropriate assumptions about the degree of disability associated with such psychiatric morbidity.[7–9] We report a systematic review of interview-based psychiatric surveys of unselected refugee populations based in economically developed western countries.

***Panel 1:* Search strategy**

Arts and Humanities Index; British Humanities Index; Cumulative Index to Nursing and Allied Health Literature, Dissertations Abstracts International; EMBASE; Educational Resources Information Centre; MEDLINE; PsychINFO; System for Information on Grey Literature in Europe; Sociological Abstracts; Social Services Abstracts; Sociofile; Social Sciences Citation Index using combinations of keywords relating to psychiatric illnesses (mental*, psych*, depress*, PTSD, stress, anxiety) and to refugees (refugee*, migrant*, immigrant*, asylum seeker*).

Methods

We searched for interview-based studies of the prevalence of post-traumatic stress disorder, major depression, psychotic illnesses, and generalised anxiety disorder in general populations of refugees resident in high-income western countries defined by membership of the Organisation for Economic Cooperation and Development. To help reduce possible reporting and selection biases, we excluded studies in which diagnoses were made solely on the basis of self-report questionnaires or that included refugees referred to clinical or other health-care services.[3,10,11] We did computer-based searches of studies published between Jan 1, 1966, and Dec 31, 2002 (panel 1). We scanned relevant reference lists, manually searched the reference

literature at the Refugee Studies Centre Library, University of Oxford (which contains the largest collection of material worldwide on forced displacement) as well as the *Journal of Traumatic Stress*, the *Journal of Refugee Studies* and *International Migration Review*; and contacted authors of published reports who provided unpublished data. We also corresponded with the investigators of five major community-based psychiatric surveys to find out if any unreported data were available for the immigration status of the populations they had investigated, but none reported such information.[12–17] Non-English articles were translated.

For every eligible study,[8,18–36] we established (with a fixed protocol supplemented by correspondence with authors): year and country of study; country of origin of refugee population; definition of refugee; sampling framework and method; diagnostic methods; number surveyed; number tested positive for each diagnosis; age (mean, range, SD); proportion of men; whether the interview was done by a native speaker or if an interpreter was present; and mean duration of displacement and immigration status (refugee or asylum seeker). Prevalence rates were of current diagnoses only, with the exception of three studies, which used the composite international diagnostic interview that recorded 1-year prevalence rates.[8,18,23] One study was not included because the original data were lost.[37] In many situations, resettled refugees can only be self-identified, and surveys based on such ascertainment strategies were included in the present report. Of the studies included in the review, one investigated only asylum seekers,[23] and another consisted of a combination of refugees and asylum seekers, of which more than four-fifths were refugees.[18] In studies that surveyed participants serially, data from the first survey were used unless a later dataset had improved diagnostic methods.[4,20] If a survey did not provide separate information on its adolescent and adult respondents, then data were included in the adult category if most participants were older than 15 years.[30,32,33,36]

See Lancet Online for webtables 1–5

Prevalence rates of particular disorders were combined by direct summation of numerators and denominators across studies, thereby providing weighted averages, as described elsewhere.[38] Confidence intervals were calculated with exact methods.[39] To make some allowance for multiple comparisons, we used 99% CIs for every study (or for aggregations of smaller studies of 20–100 participants; studies of fewer than 20 participants are not shown). Since prevalence of mental disorder was strongly related to sample size of study, the main results have been subdivided by whether studies consisted of 200 or more, or less than 200 participants. Possible sources of heterogeneity were investigated by grouping studies by relevant characteristics, such as ethnic group, age-group, etc, and by χ^2 tests. To measure the contribution to heterogeneity of a particular factor independent of other general attributes of smaller studies, relevant characteristics were assessed in random effects models[40] (with ungrouped data for continuous variables), after adjustment for other characteristics and for study size.

Role of the funding source

The sponsors of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Results

We investigated 20 studies reported in 24 publications providing data for a total of 6743 adult refugees (see webtables 1–5 at http://image.thelancet.com/extras/04ART7119webtables).[4,8,18–36,41–44] Studies were undertaken in seven countries: Australia[8,23] (1199 refugees), Canada[18,36] (364), Italy[31] (40), New Zealand[21] (223), Norway[4,20] (129), the UK[28] (120), and the USA[19,22,24–27,29,30,32,33–35,42–44] (4668). Supplementary data were obtained for ten studies after correspondence with authors.[8,18,19,23,27,28,31,34–36] In a few studies, diagnoses were made solely on the basis of clinical interview,[19,25,28,31] but in most studies trained interviewers made diagnoses using validated diagnostic methods, mainly with semi-structured interviews. One study reported findings from two different populations.[26] Panel 2 shows the methods used to diagnose psychiatric disorders. Study participants could contribute more than one relevant diagnosis to the present meta-analysis.

17 studies of post-traumatic stress disorder were identified, with data for a total of 5499 adult refugees.[8,18–33] The studies were undertaken in seven countries, and the refugees were from four main regions: southeast Asia, former Yugoslavia, middle east, and Central America. Participants had a weighted mean age of 27 years and 51% (2773 of 5436 with relevant information) were men. Overall, about 9% (99% CI 8–10%) were diagnosed with post-traumatic stress disorder, and there was substantial heterogeneity between the studies ($p<0·0001$: figure 1). Since restriction of attention to larger studies should keep to a

Panel 2: Diagnostic methods

The diagnostic interview schedule,[21,30,34,35] the structured clinical interview for the diagnostic and statistical manual,[26,27,29,33] the composite international diagnostic interview,[8,18,23] the present state examination,[20] the post-traumatic symptom scale,[22] the clinician-administered post-traumatic stress disorder scale,[24,28,33] the schedule for affective disorders and schizophrenia,[30] the schedule for affective disorders and schizophrenia for school-age children,[26,32] diagnostic interview schedule for children,[36] and the anxiety disorders interview schedule-revised.[24,27]

minimum potential biases associated with smaller studies, such as non-optimum features of design and the preferential publication of striking findings—ie, publication bias—we included only the studies with at least 200 participants in the combined estimate, although substantial heterogeneity remained in these nine studies ($p<0·0001$). Figure 2 shows variation in prevalence rates of post-traumatic stress disorder by characteristics of study design and study population, but total heterogeneity in all studies was explained only partly by ethnic group ($p<0·0001$), age-group ($p<0·0001$), host country ($p<0·0001$), duration of displacement ($p<0·0001$), sample size ($p<0·0001$), diagnostic method ($p<0·0001$), sampling method ($p<0·0001$), and language of interviewer ($p<0·0001$), but when studied jointly in a random effects model only sample size remained a significant factor ($p=0·0001$).

14 studies of major depression were identified, providing data for a total of 3616 adult refugees.[8,18,20,26–36] These studies were done in six countries and the refugees were from three main regions: southeast Asia, former Yugoslavia, and Haiti and Cuba. Participants had a weighted mean age of 33 years and 49% were men (1765 of 3616). Overall, in the studies with at least 200 participants, about 5% (4–6%) were diagnosed with major depression, and there was substantial heterogeneity in the studies ($p<0·0001$: figure 3). Figure 4 shows variation in prevalence rates of major depression by characteristics of study design and study population, but total heterogeneity was explained only partly by ethnic group ($p=0·025$), age-group ($p<0·0001$), host country ($p=0·003$), duration of displacement ($p<0·0001$), size of sample ($p<0·0001$), diagnostic method ($p<0·0001$), sampling method ($p<0·0001$), and language of interviewer ($p<0·0001$). When these characteristics were tested jointly in a random effects model, studies with non-optimum study characteristics (such as smaller sample size [$p=0·0001$]; lack of random sampling methods [$p<0·0001$]; unstructured assessment of depression [$p=0·002$]; interviewers not native to the refugees' ethnic group [$p=0·017$]) generally yielded higher prevalence rates than did studies with more rigorous methods.

Only two studies of psychotic illnesses were identified consisting of data for a total of 226 adult refugees.[20,35] Overall, about 2% (1–6%) of refugees were diagnosed with a psychotic illness (test for heterogeneity: $p=0·89$). Only five studies of generalised anxiety disorder were identified, with data for a total of 1423 adult refugees.[20,27,29,34,35] Overall about 4% (3–6%) of refugees were diagnosed with generalised anxiety disorder (test for heterogeneity: $p=0·05$). In nine studies workers reported some data on comorbid psychiatric disorders.[8,23,26–31,33] In the four studies that provided information on the comorbidity of major depression and post-traumatic stress disorder,[31–33,35] 71% (37/52) of those diagnosed with major depression also had a diagnosis of post-traumatic stress disorder, and 44% (37/85) of those diagnosed with post-traumatic stress disorder also had a diagnosis of major depression. Such high levels of comorbidity might partly be due to small studies with potentially unrepresentative samples, diagnostic inaccuracies, or both.

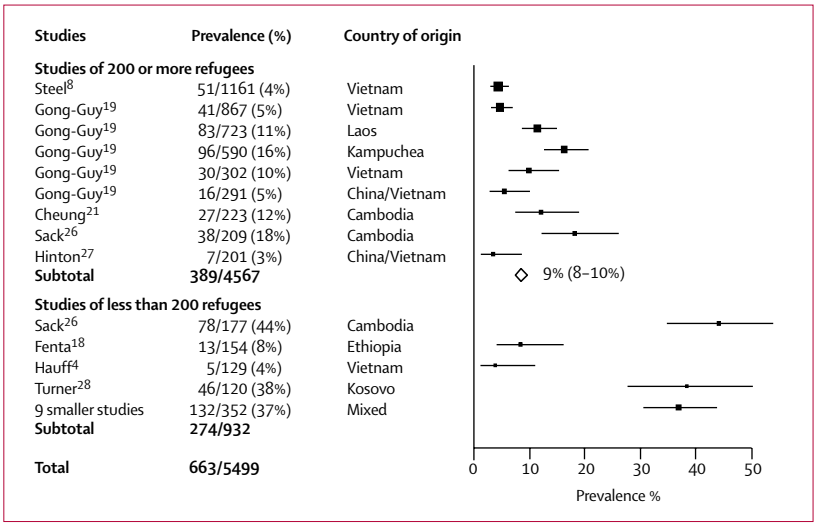

Figure 1: **Prevalence of post-traumatic stress disorder in refugees**
Areas of squares are proportional to the effective sample size; horizontal lines indicate 99% CIs; and open diamonds denote subtotals.

Five studies of post-traumatic stress disorder in children and adolescents younger than 18 years were identified, providing data for a total of 260 refugee children.[25,45–48] The studies were undertaken in Canada,[45] Sweden,[46–48] and the USA[25] with refugee children from Bosnia, Central America, Iran, Kurdistan, and Rwanda.

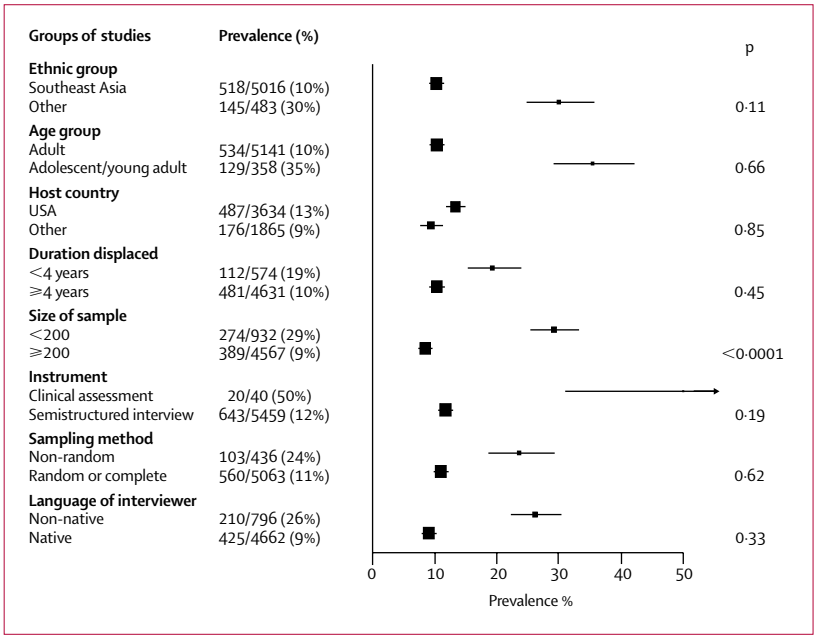

Figure 2: **Prevalence of post-traumatic stress disorder by various study characteristics**
*p values derived from random-effects models with joint assessment of study characteristics; areas of squares are proportional to the effective sample size; horizontal lines indicate 99% CIs.

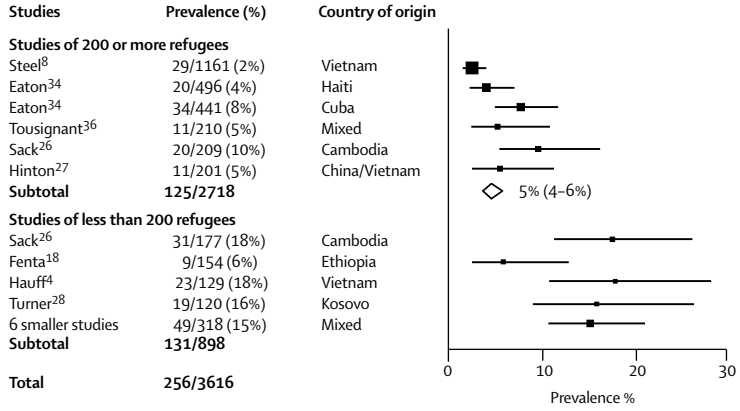

Figure 3: **Prevalence of major depression among refugees**
Areas of squares are proportional to the effective sample size; horizontal lines indicate 99% CIs; and open diamonds denote subtotals.

Supplementary data and clarification were provided by three studies after correspondence with authors.[45,46,48] Post-traumatic stress disorder was assessed by clinical interviews,[25,47] the diagnostic interview for children and adolescents,[46] the child post-traumatic symptom scale,[45] and supplementary parental interviews.[25,48] Overall 11% (7–17%) of refugee children were diagnosed with post-traumatic stress disorder (test for heterogeneity: p=0·57). No relevant studies of depression in children were identified.

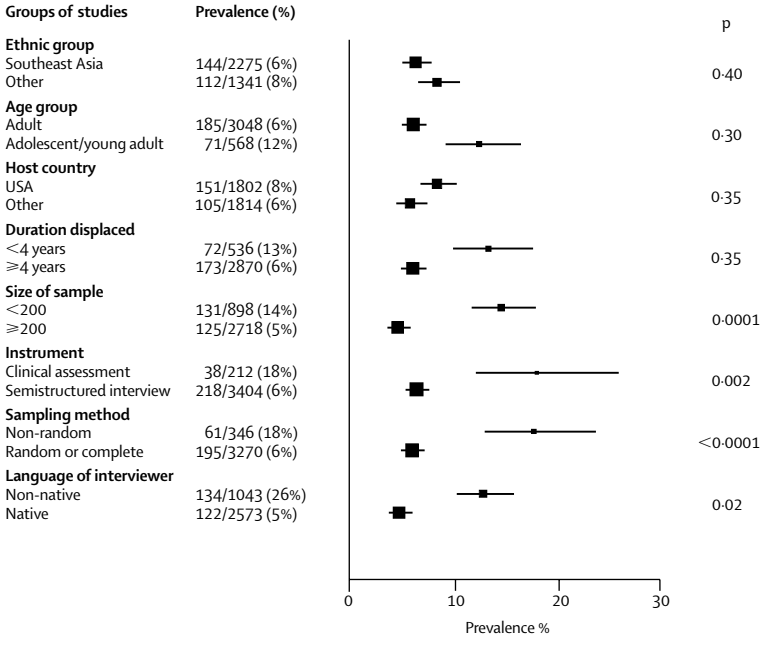

Figure 4: **Prevalence of major depression by various study characteristics**
*p values derived from random-effects models with joint assessment of study characteristics; areas of squares are proportional to the effective sample size; horizontal lines indicate 99% CIs

Discussion

Our meta-analysis suggests that about one in ten adult refugees in western countries has post-traumatic stress disorder, about one in 20 has major depression, and about one in 25 has a generalised anxiety disorder, with the probability that these disorders overlap in many people.[49] These prevalence estimates are much lower than some frequently cited claims based on less reliable estimates than ours,[5,50] especially in relation to major depression, for which the overall prevalence rates in refugees are similar to those in several general western populations.[41,51] Refugees based in western countries could be about ten-times more likely than the age-matched general American population to have post-traumatic stress disorder.[41] This disorder is a potentially disabling condition characterised by traumatic flash-backs, hypervigilance, and emotional numbing that might be a risk factor for substance abuse and suicide.[49] Data in the present meta-analysis (about two-thirds of which are derived from the USA) suggest that roughly 50 000 of about 500 000 current refugees[2] living in the USA have post-traumatic stress disorder, with even larger numbers probably affected of the 2·5 million former refugees settled there between 1975 and 2002.[52] The exact burden of disability implied by such numbers is, however, unknown because many surveys did not record the functional impairment (or treatment needs[7,8]) associated with the disorder in refugees in whom triggering factors,[50,53] psychiatric comorbidity,[8,23,26–31,33] and long-term consequences of non-treatment have been reported to differ from those of other groups with post-traumatic stress.[32]

The potential limitations of our study should be carefully considered. Even in interview-based surveys, the accurate assessment of psychiatric disorders is difficult to ensure in epidemiological studies, especially in non-western refugees for whom the validity of psychiatric measures developed in western populations might be restricted.[54–56] The 25 surveys contributing to the present review were done over several decades, in refugees with diverse experiences from four different continents, and in seven host countries with varying policies about the entry of refugees (eg, Canada and Australia preferentially accept refugees with high educational levels[57]). The scope for diversity is widened further by substantial variations in surveys in the sampling methods and diagnostic instruments used (as illustrated in the webtables). Most sampling frameworks used were necessarily opportunistic (involving, for example, refugees identified in student enrolment lists and in health-screening programmes), reducing the ability to extrapolate the findings. Hence, even though our meta-analysis has helped to reduce the effect of publication bias and other biases in smaller studies by focusing on the larger and generally more rigorous surveys, substantial heterogeneity persists in its overall findings. About three-quarters of participants studied in

our review were from southeast Asian countries, including Vietnam, following the conflicts of 1965–80, underscoring the need for new surveys that quantify the burden of psychiatric morbidity in people who are now (or have recently been) displaced. About 9 million of the world's 13 million refugees live in developing countries (and about half of them are children),[2] but most psychiatric surveys of refugees have been done in adults in western countries. The evidence is similarly sparse for other vulnerable groups, such as asylum seekers (of which there were more than 100 000 in the UK in 2002 alone)[58] and the estimated 22 million people worldwide internally displaced in their own countries, usually by war.[2]

Even if there are differences in the prevalence rates of serious psychiatric disorders in different refugee populations based in western countries, assessment of the overall evidence could help policy-makers and public-health practitioners to avoid basing decisions on particular surveys that could either exaggerate or underestimate the burden of disease, especially in areas where there is little local information. Our overall estimates will need to be used judiciously, in view of the fact that it is difficult to know whether the diverse refugee groups contributing to this analysis were representative of the refugee populations resettled in western countries. Nevertheless, our review suggests that at least several tens of thousands of current refugees in western countries have post-traumatic stress disorder.

Contributors

M Fazel and J Danesh designed and conducted the study and drafted the report, and together with J Wheeler, analysed and interpreted the findings.

Conflict of interest statement

We declare that we have no conflict of interest.

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