Burden of child maltreatment in China

Citation for published version:

Digital Object Identifier (DOI):
10.2471/BLT.14.140970

Link:
Link to publication record in Edinburgh Research Explorer

Document Version:
Peer reviewed version

Published In:
Bulletin of the World Health Organization

Publisher Rights Statement:

General rights
Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy
The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.
Xiangming Fang et al.

Burden of child maltreatment in China

This online first version has been peer-reviewed, accepted and edited, but not formatted and finalized with corrections from authors and proofreaders.

The burden of child maltreatment in China

Xiangming Fang,\textsuperscript{a} Deborah A Fry,\textsuperscript{b} Kai Ji,\textsuperscript{c} David Finkelhor,\textsuperscript{c} Jingqi Chen,\textsuperscript{d} Patricia Lannen\textsuperscript{e} & Michael P Dunne\textsuperscript{f}

\textsuperscript{a} Department of Applied Economics, College of Economics and Management, China Agricultural University, No. 17 Qinghuadong Road, Haidian District, Beijing, 100083, China.

\textsuperscript{b} University of Edinburgh, Edinburgh, Scotland.

\textsuperscript{c} Crimes Against Children Research Center, University of New Hampshire, Durham, United States of America.

\textsuperscript{d} Institute of Child and Adolescent Health, Peking University Health Science Center, Beijing, China.

\textsuperscript{e} Child Protection Program, UBS Optimus Foundation, Zurich, Switzerland.

\textsuperscript{f} The Children and Youth Research Centre, Queensland University of Technology, Kelvin Grove, Australia.

Correspondence to Xiangming Fang (email: xmfang@cau.edu.cn).

(Submitted: 2 May 2014 – Revised version received: 1 November 2014 – Accepted: 6 November 2014 – Published online: 20 January 2015)

Abstract

Objective To estimate the health and economic burdens of child maltreatment in China.

Methods We did a systematic review for studies on child maltreatment in China using PubMed, Embase, PsycInfo, CINAHL-EBSCO, ERIC and the Chinese National Knowledge Infrastructure databases. We did meta-analyses of studies that met inclusion criteria to estimate the prevalence of child neglect and child physical, emotional and sexual abuse. We used data from the 2010 global burden of disease estimates to calculate disability-adjusted life-years (DALYs) lost as a result of child maltreatment.

Findings From 68 studies we estimated that 26.6% of children under 18 years of age have suffered physical abuse, 19.6% emotional abuse, 8.7% sexual abuse and 26.0% neglect. We estimate that emotional abuse in childhood accounts for 26.3% of the DALYs lost because of mental disorders and 18.0% of those lost because of self-harm. Physical abuse in childhood accounts for 12.2% of the DALYs lost because of depression, 17.0% anxiety, 20.7% problem drinking, 18.8% illicit drug use and 18.3% self-harm. The consequences of physical abuse of children costs China an estimated 0.84% of its gross domestic product – i.e. 50 billion United States dollars – in 2010. The corresponding losses attributable to emotional and sexual abuse in childhood were 0.47% and 0.39% of the gross domestic product, respectively.

Conclusion In China, child maltreatment is common and associated with large economic losses because many maltreated children suffer substantial psychological distress and might adopt behaviours that increase their risk of chronic disease.
Introduction

In the past decade there has been considerable growth in the analysis of the occurrence and consequences of maltreatment and other adversities in childhood.\textsuperscript{1–3} The maltreatment of children has been found to impair the current and future health and well-being of the children in every country and cultural context in which it has been investigated. The morbidity, disability and mortality caused by child abuse and neglect lead to substantial human suffering, social disadvantage and economic loss.\textsuperscript{4,5}

In China, research in this field has a short history.\textsuperscript{6} There have been no national assessments of child maltreatment and only a few comprehensive provincial studies. However, the results of early descriptive surveys of child sexual\textsuperscript{7–10} and physical abuse\textsuperscript{11} and some more recent relevant data\textsuperscript{12,13} have been included in global and regional reviews.\textsuperscript{2,3,14,15} There has also been one systematic review that focused solely on the prevalence of child sexual abuse in China.\textsuperscript{16} There have been no comprehensive studies in China that cover all forms of child maltreatment, examine the consistency of the apparent impacts of such maltreatment on health and well-being or estimate the probable economic consequences. The paucity of official statistics on the incidence of child maltreatment reported to judicial, educational, health and social services – and on the economic costs incurred by such services as a consequence of such maltreatment – also poses a major barrier to the development of an effective and evidence-based policy for child protection in China.

The purpose of this paper was to synthesize the results of previous community-based research on child maltreatment in China. We derived summative estimates of prevalence on emotional, physical and sexual abuse and neglect of children under 18 years of age. We also calculated the magnitude of associations between child maltreatment and consequent poor mental health and health-risk behaviours. We then estimated economic impact of child maltreatment in China. Our observations indicate both the extent to which this major cause of morbidity and disability has been overlooked in China and the research that is still required.

Methods

Systematic review

We searched PubMed, Embase, PsycInfo, CINAHL-EBSCO, ERIC and the Chinese National Knowledge Infrastructure for papers published from the inception of each database to 31 December 2013 using search term combinations of \textit{China with child}
abuse, emotional abuse, physical abuse, sexual abuse or child neglect – and their Chinese equivalents. Languages were restricted to English and Chinese. Two reviewers identified and screened potentially relevant articles in Chinese and English and independently assessed the quality of each study that met the inclusion criteria. To identify additional relevant studies, we contacted 18 researchers and organizations involved in child protection in China and checked the reference lists of key narrative reviews on child maltreatment in or around China.6,13,14,16,17

Prevalence studies were included if they met the following criteria: (i) published in a peer-reviewed journal; (ii) participants recruited from a student or general population; (iii) quantitative methods were used to estimate the prevalence of the maltreatment of participants when they were younger than 18 years; (iv) reported a lifetime prevalence of child maltreatment; and (v) the recorded maltreatment had been reported directly by the victims. Studies on the possible consequences – to the victims – of child maltreatment were included if these: (i) represented primary research that had explored the relationship between at least one form of child maltreatment and its impact on employment, education, mental health, physical health, health behaviours, aggression, violence, criminality, exposure to further violence or use of health services;1 (ii) included the calculation of odds ratios (ORs) or relative risks (RRs) disaggregated by the type of maltreatment; and (iii) had not sampled on the basis of the presence of any specified outcome – since this would have invalidated the calculation of an OR or RR for that outcome.18

The abstract of each article of potential interest was screened to see if the article met our inclusion criteria. We then read the full text of each included article and extracted key variables related to study design and findings. The authors of the articles were contacted if additional information was needed.

Each article was reviewed for data quality by using the Newcastle–Ottawa Scale for case–control and cohort studies19 and Boyle’s guidelines for evaluating prevalence studies.20 The risk of bias in each included study was determined as in an earlier regional systematic review on child maltreatment.14

**Meta-analyses**
Following the example of Andrews et al.,18 we conducted multiple linear regression analyses to examine the characteristics of the methods that may have influenced previous estimates of the prevalence of child maltreatment. The characteristics
examined included type of sample, sample site and size, response type and rate, whether maltreatment was defined as a single or repeated act, whether validated instruments were used and whether specific behavioural questions were asked.

Based on the multiple regression analyses, the unstandardized regression coefficients for the significant predictors of child neglect, emotional abuse and physical abuse were used to adjust the corresponding prevalence. That is, the prevalence of emotional abuse was adjusted from any to repeated abuse, the prevalence of child physical abuse was adjusted to rates generated by validated instruments such as the Conflict Tactics Scale, and the prevalence of child neglect was adjusted to rates reported by studies that had used large samples and asked specific questions about neglect. The prevalence of contact sexual abuse was used as the estimate of the prevalence of any sexual abuse – because the use of any broad definition of non-contact sexual abuse may easily lead to an overestimate of the prevalence of sexual abuse. As girls are generally more likely to suffer sexual abuse than boys, we made separate estimates of the prevalence of contact sexual abuse in childhood for females and males.

In seven studies, subtraction of the unstandardized coefficients from the reported prevalence produced negative values. These studies were excluded from the final meta-analyses.

Finally, for each of the four types of child maltreatment, a set of adjusted prevalence estimates were combined using random-effects meta-analysis. The separate rates for sexual abuse of boys and girls were combined to produce an overall rate for such abuse – assuming that the Chinese population had 106 males for every 100 females. The Cochran's Q tests were conducted to assess the heterogeneity across studies.

**Population attributable fractions**
To calculate a population attributable fraction, it is necessary to know the prevalence of a risk factor – e.g. maltreatment in childhood – and the RR for the disease or outcome of interest – e.g. depression – given exposure to that risk factor. Since we found only a few articles that reported the effects of child maltreatment on physical health, we focused on outcomes associated with mental health and health-risk behaviours. To match the outcomes with the available global burden of disease categories, the outcomes were further limited to: current smoker, problem drinking,
Illicit drug use, self-harm and mental disorder – including depression and anxiety. For each of these outcomes, we attempted to calculate a population attributable fraction for each type of child maltreatment that we considered.

If only the unadjusted ORs for a study were available, we produced corresponding estimates of adjusted ORs using the ratios between adjusted and unadjusted ORs reported for other studies. Similarly, as only ORs for suicide attempt – rather than self-harm – following sexual abuse were available, we produced estimates of the corresponding OR for self-harm by using the ratio between the ORs for self-harm and suicide attempt following physical abuse. As most studies included in the systematic review reported ORs but not RRs, RRs had to be estimated from the ORs.

In some of our included studies, only RRs for various levels of exposure to a type of maltreatment were available. For these studies, we estimated general RRs for a type of maltreatment by calculating weighted averages – with the numbers of cases at each level of exposure used as the weights.

Finally, for each type of child maltreatment, the estimated RRs were grouped according to outcomes and then combined using random-effects meta-analysis.

**Economic burden**

We attempted to estimate the economic losses associated with child maltreatment in China. Following the work of the World Health Organization (WHO) and Brown, we estimated the disability-adjusted life-years (DALYs) lost – because of mental health disorders attributable to child maltreatment and health-risk behaviours – and then estimated the monetary value of those DALYs.

For each of the main types of child maltreatment that we considered, a population attributable fraction for an outcome of interest was multiplied by the estimate of the number of the DALYs expected to be lost because of that outcome. Population attributable fractions of our selected health and behavioural outcomes (mental disorder, depression, anxiety, current smoker, problem drinking, illicit drug use, and self-harm) were matched to definitions of “mental disorder,” “unipolar depressive disorders,” “anxiety disorders,” “tobacco smoking,” “alcohol use,” “illicit drug use,” and “self-harm” respectively, from the 2010 global burden of disease China study.
For physical abuse and also for emotional abuse, the population attributable fraction for the overall measure of mental disorders was available (Table 3). This was multiplied by an overall estimate of the DALYs lost because of any form of mental ill health. It was often impossible to compute values for individual mental health conditions since population attributable fractions for many such conditions have yet to be estimated. For sexual abuse, population attributable fractions for depression and anxiety – but not for the overall measure of mental ill health – were available (Table 3), and therefore these two individual conditions were used to estimate the DALYs lost because of mental health disorders following sexual abuse in childhood.

As in previous studies, we assumed that, in monetary terms, one DALY in China was equal to the per-capita gross domestic product. Data on the size of China’s population and its per-capita gross domestic product in 2010 were obtained from the World Bank.

Results
The systematic review identified 68 studies that met our inclusion criteria (Fig. 1), which of 62 reported prevalence estimates and 14 consequences. Eight studies were reporting both. For our prevalence estimates, we originally used data from 31 studies on child emotional abuse, 36 studies on physical abuse, 18 studies on neglect and 16 studies on sexual abuse among females and 12 studies of sexual abuse among males. (Table 1; available from: http://www.who.int/bulletin/volumes/#/##/##-######). All of our included studies had a low or medium risk of bias. A weak sampling design, lack of statistical reporting – e.g. a lack of confidence intervals (CIs) – or the use of researcher-developed questions led to a medium risk of bias.

Three studies were excluded from the final meta-analyses for each of the three types of child maltreatment: emotional abuse, physical abuse and neglect. In these studies, subtraction of the unstandardized coefficients from the reported prevalence estimates produced negative values. Thus, the final five meta-analyses were based on 28 studies on emotional abuse, 33 on physical abuse, 15 on neglect and 16 on sexual abuse for females and 12 studies of sexual abuse of males (Table 1).
The unadjusted and adjusted prevalence estimates from the included studies for emotional abuse, physical abuse and neglect are shown in Fig. 2 and Fig. 3 (available from: http://www.who.int/bulletin/volumes/##/##-####). The estimates for sexual abuse have been published.\textsuperscript{16} Table 2 presents our unadjusted and adjusted estimates of the prevalence of each type of child maltreatment in China. Table 3 shows the RRs and population attributable fractions for the health and behavioural outcomes associated with each type of child maltreatment. No relevant data were available for child neglect. We estimate that for mental disorder, the population attributable fraction of emotional abuse is 26.3%, while population attributable fraction of physical abuse is 18.8%. The population attributable fractions for physical abuse varied between 9.6% and 20.7% in the seven outcomes that we investigated. In general, the population attributable fractions for physical abuse were higher than those for sexual or emotional abuse.

The numbers and economic values of the DALYs lost because of child maltreatment are shown in Table 4. Although only a limited number of health outcomes were considered, an estimated 11 288 200 of DALYs lost in China in 2010 were attributable to child physical abuse. The estimated economic value of these lost DALYs was 50 billion United States dollars – or 0.84% of China’s gross domestic product in 2010. Even though we considered the impacts of child emotional abuse on only mental health disorders and self-harm, we estimated that such abuse caused 6 334 700 of the DALYs lost in China in 2010. The DALYs lost in 2010 because of child emotional and sexual abuse had estimated values equivalent to 0.47% and 0.39% of China’s gross domestic product in 2010, respectively.

Discussion
We estimate the general burden of child maltreatment in China. Maltreatment is a common experience for Chinese children. Despite a paucity of data on the impact of child maltreatment on child and adult health, the associations between such maltreatment and subsequent poor mental health and harmful behaviours in China are substantial and consistent with the results of research elsewhere.\textsuperscript{92,93} According to our calculations, 11.3 million of the DALYs lost in China in 2010 were attributable to child physical abuse. This value lies between the corresponding estimates for diabetes mellitus – 7.8 million DALYs lost – and ischaemic heart disease – 17.8 million DALYs lost.\textsuperscript{30} The size of this burden justifies further research and increased efforts
to improve child protection in China, especially since our estimates of the burdens of child maltreatment are based on the available data on a small number of health outcomes and are therefore likely to be underestimates.

There is a paucity of Chinese data on child neglect and emotional abuse and their associated consequences. If the financial burden of child maltreatment is to be accurately assessed in China, there is also a need for additional information on child-maltreatment-attributable losses in productivity and the short- and long-term medical costs of child maltreatment. Another considerable gap in our current understanding is that, as no community-based study on temporal changes in child maltreatment in China has been published, it remains unclear if the problem is getting better or worse or staying unchanged. Population-based research that provides estimates of the temporal changes across a broad spectrum of childhood abuse, neglect and other adversities should be a core element of any comprehensive national prevention response.

Our study had several limitations and had several major gaps in the relevant evidence base. Most of data that we used for calculating prevalence and population attributable fractions came from studies that did not employ representative samples. Many of our included studies only investigated one type of maltreatment or – if they investigated several types – did not report disaggregated data. The high level of variation in the reported prevalence of maltreatment is worrying and possibly indicative of substantial variation in how maltreatment has been defined and evaluated and in the sampling method used. Population attributable fractions can be sensitive to small changes in prevalence and RR and this problem may be exacerbated when the fractions are based on data from multiple studies. Although we carefully reviewed all input data to select appropriate studies, our results rest squarely on the – often uncertain – quality of the available data. By using DALYs, we were only able to estimate the non-fatal health burden posed by child maltreatment. We could find no data on maltreatment-attributable child mortality in China. However, WHO recently estimated that, in China, 1266 children aged 0–14 years died from interpersonal violence in 2012 – resulting in 111 170 years of life lost. It seems very likely that, in China, there are also violent deaths among adolescents aged 15–18 years and that some children commit suicide as a result of maltreatment.
As some of the health outcomes that we investigated may have overlapped, our estimates may have been affected by the double-counting of DALYs lost. However, we carefully scrutinized all study inputs and population attributable fractions to try to minimize this problem. As far as possible, we maintained one-to-one correspondence between the population attributable fractions and the burden measures from the global burden of disease 2010 study in China.

Many of the studies that we included in our review excluded many possibly important confounding factors and may therefore have overestimated the direct effects of child maltreatment. For example, it is almost impossible to know if genetic inheritance may explain some portion of the associations between maltreatment and outcomes. The accuracy of our estimates was also limited by the fact that most of the data on prevalence and outcomes that we used were self-reported in cross-sectional studies where maltreatment was measured retrospectively.

After considering all of the limitations of our study, we think that our burden estimates are probably underestimates of the true values. Many of the serious effects of child maltreatment – e.g. poor educational and employment outcomes, high levels of health-care utilization, criminal behaviour and reproductive health problems – were not included because no relevant studies have been published. In addition, no estimates are available of the costs to the Chinese police and child welfare services of child maltreatment.

Despite the gaps in the current evidence base, this study indicates the importance of prioritizing child maltreatment as a key health concern in China. It also underscores the need to steer resources towards child protection and to strengthening the knowledge base regarding the scale and consequences of child maltreatment at national level.

Acknowledgements
MPD has a dual affiliation with the Institute for Community Health Research, Hue University of Medicine and Pharmacy, Hue, Viet Nam.

Funding:
This research was partially supported by the China Office of the United Nations Children’s Fund.

Competing interests:
None declared.
References


12. Leung PW, Wong WC, Chen WQ, Tang CS. Prevalence and determinants of child maltreatment among high school students in Southern China: a


70. Ma YX, Chen JQ. Childhood noncontact corporal punishment and its association with the health related risk behaviors in female students. Chin Gen Pract. 2007;10(9):725–7. [Chinese]


Table 1. **Studies included for the analysis of child maltreatment in China**

<table>
<thead>
<tr>
<th>Study</th>
<th>Type of study</th>
<th>Maltreatment</th>
<th>Sample size</th>
<th>Risk of bias</th>
<th>Excluded maltreatment in meta-analysis</th>
<th>RR estimation, maltreatment – outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cai (2008)</td>
<td>Prevalence</td>
<td>Emotional, physical, neglect</td>
<td>270</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chan &amp; Yan (2013)</td>
<td>Prevalence</td>
<td>Physical, sexual</td>
<td>18,341</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen &amp; Liao (2011)</td>
<td>Prevalence</td>
<td>Emotional</td>
<td>430</td>
<td>Medium</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen et al. (2003)</td>
<td>Prevalence</td>
<td>Sexual</td>
<td>239</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen et al. (2006)</td>
<td>Prevalence</td>
<td>Physical</td>
<td>528</td>
<td>Medium</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen et al. (2006)</td>
<td>Prevalence</td>
<td>Sexual</td>
<td>528</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen et al. (2010)</td>
<td>Prevalence</td>
<td>Sexual</td>
<td>2,508</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen (2005)</td>
<td>Prevalence</td>
<td>Emotional, physical, neglect</td>
<td>291</td>
<td>Medium</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen et al. (2004)</td>
<td>Prevalence</td>
<td>Sexual</td>
<td>2,300</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen et al. (2006)</td>
<td>Prevalence</td>
<td>Sexual</td>
<td>351</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen et al. (2002)</td>
<td>Prevalence</td>
<td>Sexual</td>
<td>985</td>
<td>Medium</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen et al. (2004)</td>
<td>Prevalence</td>
<td>Sexual</td>
<td>892</td>
<td>Medium</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chen et al. (2008)</td>
<td>Prevalence</td>
<td>Emotional, physical, neglect</td>
<td>528</td>
<td>Medium</td>
<td>Emotional</td>
<td>–</td>
</tr>
<tr>
<td>Cheng et al. (2011)</td>
<td>Consequences</td>
<td>Physical</td>
<td>1,628</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Cong et al. (2012)</td>
<td>Consequences</td>
<td>Sexual</td>
<td>4,567</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chou et al. (2011)</td>
<td>Prevalence</td>
<td>Physical</td>
<td>1,966</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Ding et al. (2007)</td>
<td>Prevalence</td>
<td>Emotional, physical</td>
<td>485</td>
<td>Medium</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Dong et al. (2010)</td>
<td>Prevalence</td>
<td>Emotional, neglect</td>
<td>1,193</td>
<td>Low</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Study</td>
<td>Year</td>
<td>Type</td>
<td>Prevalence</td>
<td>Consequences</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>------</td>
<td>---------------------------</td>
<td>--------------------------------</td>
<td>---------------------------------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>Gao et al. (2011)</td>
<td>2011</td>
<td>Prevalence</td>
<td>Emotional, physical, neglect</td>
<td>301 Medium</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Gao et al. (2013)</td>
<td>2013</td>
<td>Prevalence</td>
<td>Neglect</td>
<td>685 Low</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Gu et al. (2005)</td>
<td>2005</td>
<td>Prevalence</td>
<td>Sexual</td>
<td>1 635 Medium</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Hester et al. (2009)</td>
<td>2009</td>
<td>Prevalence</td>
<td>Physical</td>
<td>498 Medium</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Hou et al. (2010)</td>
<td>2010</td>
<td>Prevalence</td>
<td>Emotional</td>
<td>757 Medium</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Hu et al. (2005)</td>
<td>2005</td>
<td>Prevalence</td>
<td>Emotional, physical</td>
<td>336 Medium</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Huang et al. (2006)</td>
<td>2006</td>
<td>Prevalence</td>
<td>Emotional, physical, neglect</td>
<td>335 Medium</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Lau et al. (2003)</td>
<td>2003</td>
<td>Consequences</td>
<td>Physical</td>
<td>489 Low</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Lau et al. (2005)</td>
<td>2005</td>
<td>Consequences</td>
<td>Physical</td>
<td>95 788 Low</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Li et al. (2012)</td>
<td>2012</td>
<td>Consequences</td>
<td>Sexual</td>
<td>4 084 Low</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Li et al. (2014)</td>
<td>2014</td>
<td>Prevalence</td>
<td>Emotional, physical</td>
<td>485 Low</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Lin et al. (2011)</td>
<td>2011</td>
<td>Prevalence</td>
<td>Emotional, physical</td>
<td>7 475 Low</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Lin et al. (2011)</td>
<td>2011</td>
<td>Prevalence</td>
<td>Sexual</td>
<td>683 Low</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Lu et al. (2012)</td>
<td>2012</td>
<td>Prevalence</td>
<td>Emotional, physical</td>
<td>796 Medium Emotional</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Ma &amp; Chen (2007)</td>
<td>2007</td>
<td>Prevalence and consequences</td>
<td>Physical</td>
<td>709 Medium</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Ma et al. (2005)</td>
<td>2005</td>
<td>Prevalence and consequences</td>
<td>Physical</td>
<td>528 Medium</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Ma et al. (2012)</td>
<td>2012</td>
<td>Prevalence</td>
<td>Emotional, physical, neglect</td>
<td>475 Low Neglect</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Shen (2009)</td>
<td>2009</td>
<td>Prevalence</td>
<td>Physical</td>
<td>1 924 Low</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Su et al. (2008)</td>
<td>2008</td>
<td>Prevalence and consequences</td>
<td>Sexual</td>
<td>1 386 Medium</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Sun et al. (2006)</td>
<td>2006</td>
<td>Prevalence</td>
<td>Sexual</td>
<td>701 Medium</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Publication</td>
<td>Article ID</td>
<td>Consequences</td>
<td>Prevalence</td>
<td>Prevalence and consequences</td>
<td>RR: relative risk.</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>------------</td>
<td>---------------</td>
<td>------------</td>
<td>-----------------------------</td>
<td>--------------------</td>
<td></td>
</tr>
<tr>
<td>Tang et al. (2011)</td>
<td>BLT.14.140970</td>
<td>Physical</td>
<td>6 564</td>
<td>Low</td>
<td>Physical – current smoker</td>
<td></td>
</tr>
<tr>
<td>Tao et al. (2006)</td>
<td></td>
<td>Emotional, physical</td>
<td>5 141</td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xiao et al. (2008)</td>
<td></td>
<td>Physical</td>
<td>10 894</td>
<td>Medium</td>
<td>Physical – mental disorder</td>
<td></td>
</tr>
<tr>
<td>Xiao (2008)</td>
<td></td>
<td>Emotional, physical, neglect</td>
<td>2 073</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xie et al. (2008)</td>
<td></td>
<td>Emotional, neglect</td>
<td>457</td>
<td>Low</td>
<td>Neglect</td>
<td></td>
</tr>
<tr>
<td>Yan et al. (2009)</td>
<td></td>
<td>Emotional, physical</td>
<td>1 200</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xie et al. (2008)</td>
<td></td>
<td>Emotional, physical, neglect</td>
<td>282</td>
<td>Medium</td>
<td>Emotional, physical, neglect</td>
<td></td>
</tr>
<tr>
<td>Yang (2012)</td>
<td></td>
<td>Emotional, neglect</td>
<td>324</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ye et al. (2006)</td>
<td></td>
<td>Physical, sexual</td>
<td>5 141</td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yen et al. (2008)</td>
<td></td>
<td>Physical</td>
<td>1 684</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yong et al. (2011)</td>
<td></td>
<td>Emotional, physical</td>
<td>1 417</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zeng et al. (2010)</td>
<td></td>
<td>Emotional, physical, neglect</td>
<td>667</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhang et al. (2010)</td>
<td></td>
<td>Neglect</td>
<td>3 539</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhao &amp; Li (2006)</td>
<td></td>
<td>Emotional, physical</td>
<td>485</td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhao et al. (2004)</td>
<td></td>
<td>Emotional, physical, neglect</td>
<td>435</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhong et al. (2012)</td>
<td></td>
<td>Emotional, physical</td>
<td>456</td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhou et al. (2010)</td>
<td></td>
<td>Physical, neglect</td>
<td>397</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhu et al. (2010)</td>
<td></td>
<td>Emotional, neglect</td>
<td>659</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhu et al. (2012)</td>
<td></td>
<td>Emotional, physical, neglect</td>
<td>2 374</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*This study was available online 22 October 2013 and therefore included in our systematic review.*
### Table 2. Estimated prevalence of four types of child maltreatment, China 1988–2013

| Type of maltreatment | Unadjusted | | | | Adjusted | | | |
|----------------------|------------|---|---|---|---|---|---|---|---|
|                      | Prevalence, % (95% CI) | No. of studies | Heterogeneity, $Q$ | | Prevalence, % (95% CI) | No. of studies | Heterogeneity, $Q$ | | |
| Physical abuse       | 39.6 (33.7–45.5) | 36 | 12 000$^a$ | | 26.6 (20.6–32.5)$^b$ | 33 | 15 000$^a$ | | |
| Emotional abuse      | 38.6 (30.2–46.9) | 31 | 11 000$^a$ | | 19.6 (15.4–23.7)$^c$ | 28 | 4556$^a$ | | |
| Sexual abuse$^d$     | 8.7         | | | | | | | | |
| Females              | 9.5 (7.5–11.5) | 16 | 414$^a$ | | – | – | – | | |
| Males                | 8.0 (6.5–9.6) | 12 | 149$^a$ | | – | – | – | | |
| Neglect              | 41.2 (15.9–66.4) | 18 | 73 000 | | 26.0 (17.4–34.6)$^f$ | 15 | 4362$^a$ | | |

CI: confidence interval.

$^a P < 0.001.$

$^b$ Adjusted for use of a validated instrument.

$^c$ Adjusted for repeated versus any abuse.

$^d$ For sexual abuse, a meta-analysis was performed separately for boys and girls. The separate rates for boys and girls were then combined to obtain an overall rate for sexual abuse, using the sex proportions as weights.

$^e$ Not adjusted because no methodological factors significantly predicted the prevalence of sexual abuse.

$^f$ Adjusted for whether a study asked specific questions and for sample size.
Table 3. **Population attributable fractions and relative risks for health outcomes associated with child maltreatment, China**

<table>
<thead>
<tr>
<th>Type of maltreatment</th>
<th>Mental disorder</th>
<th>Depression</th>
<th>Anxiety</th>
<th>Current smoker</th>
<th>Problem drinking</th>
<th>Illicit drug use</th>
<th>Self-harm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RR</td>
<td>PAF, %</td>
<td>RR</td>
<td>PAF, %</td>
<td>RR</td>
<td>PAF, %</td>
<td>RR</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>1.87</td>
<td>18.8</td>
<td>1.52</td>
<td>12.2</td>
<td>1.77</td>
<td>17.0</td>
<td>1.40</td>
</tr>
<tr>
<td>Emotional abuse</td>
<td>2.82</td>
<td>26.3</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>NA</td>
<td>NA</td>
<td>1.66</td>
<td>5.4</td>
<td>1.53</td>
<td>4.4</td>
<td>2.08</td>
</tr>
</tbody>
</table>

NA: not available; PAF: population attributable fraction; RR: relative risk.

a No relevant data were available for child neglect.

b Studies contributing to the RR calculations for each outcome are indicated in Table 1.

Table 4. **Estimates of the disability-adjusted life-years and economic value lost because of child abuse, China, 2010**

<table>
<thead>
<tr>
<th>Outcome of maltreatment</th>
<th>Physical abuse</th>
<th>Emotional abuse</th>
<th>Sexual abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DALYs lost (x1000)</td>
<td>Value lost Millions of US$</td>
<td>% of GDP</td>
</tr>
<tr>
<td>Mental disorder</td>
<td>3924.5</td>
<td>17 399.1</td>
<td>0.29</td>
</tr>
<tr>
<td>Depression</td>
<td>1429.9</td>
<td>6339.2</td>
<td>0.11</td>
</tr>
<tr>
<td>Anxiety</td>
<td>490.5</td>
<td>2174.4</td>
<td>0.04</td>
</tr>
<tr>
<td>Current smoker</td>
<td>2885.5</td>
<td>12 792.6</td>
<td>0.22</td>
</tr>
<tr>
<td>Problem drinking</td>
<td>2849.4</td>
<td>12 632.5</td>
<td>0.21</td>
</tr>
<tr>
<td>Illicit drug use</td>
<td>538.4</td>
<td>2387.0</td>
<td>0.04</td>
</tr>
<tr>
<td>Self-harm</td>
<td>1090.3</td>
<td>4833.7</td>
<td>0.08</td>
</tr>
<tr>
<td>Total</td>
<td>11 288.1</td>
<td>50045.0</td>
<td>0.84</td>
</tr>
</tbody>
</table>

DALYs: disability-adjusted life-years; GDP: gross domestic product; NA: not available; US$: United States dollars.

a Depression and anxiety are included in mental disorder, therefore they do not contribute to the total value.

Note: Inconsistencies arises in some values due to rounding.
Fig. 1. Flowchart for the selection of studies included in the systematic review on child maltreatment in China

- Records identified through database searching \((n = 3236)\)
- Additional records identified through other sources \((n = 18)\)
- Identified records of potential interest \((n = 3254)\)
- Irrelevant records excluded at initial title screen \((n = 1790)\)
- Abstracts screened \((n = 1464)\)
- Abstracts excluded \((n = 1270)\)
- Full-text articles excluded \((n = 126)\): No OR or RR calculation \((n = 25)\), No matching GBD outcomes category \((n = 9)\), Did not disaggregate by type of maltreatment \((n = 13)\), Used duplicated data \((n = 11)\), Sampled perpetrators, not victims \((n = 20)\), Reported scores, not percentages \((n = 30)\), Did not include lifetime measure of prevalence \((n = 18)\)

Studies included in final analyses \(n = 68\) (62 prevalence studies and 14 consequences with 8 studies reporting both)

GBD: Global Burden of Disease; OR: odds ratio; RR: relative risk.
Fig. 2. **Studies reporting unadjusted prevalence for childhood emotional abuse, physical abuse and neglect, China, 1988–2014**

**Study**
- Zhao, 2004
- Chen, 2004
- Yang, 2004
- Hu, 2005
- Chen, 2005
- Huang, 2006
- Zhao, 2006
- Tao, 2006
- Ding, 2007
- Cai, 2008
- Xie, 2008
- Chang, 2008
- Chen, 2008
- Xiao, 2008
- Yan, 2009
- Zeng, 2010
- Zhu, 2010
- Zhou, 2010
- Dong, 2010
- Hou, 2010
- Lin, 2011
- Gao, 2011
- Yong, 2011
- Wang, 2012
- Zhong, 2012
- Ma, 2012
- Zhu, 2012
- Yang, 2012
- Lu, 2012
- Li, 2014
- Combined

**Prevalence of emotional abuse**

- .1
- .3
- .5
- .7
- .9

Note: The dashed vertical line represents the mean combined prevalence.
Prevalence of physical abuse

Study

Samuda, 1988
Zhao, 2004
Yang, 2004
Hu, 2005
Chen, 2005
Chen, 2005
Ma, 2005
Zhao, 2006
Ye, 2006
Chen, 2006
Huang, 2006
Tao, 2006
Ding, 2007
Ma, 2007
Chen, 2008
Xiao, 2008
Xiao, 2008
Yen, 2008
Cai, 2008
Hester, 2009
Yan, 2009
Shen, 2009
Zeng, 2010
Fuh, 2010
Qiu, 2010
Gao, 2011
Lin, 2011
Yong, 2011
Chou, 2011
Wang, 2012
Zhong, 2012
Lu, 2012
Zhu, 2012
Ma, 2012
Chan, 2013
Li, 2014
Combined

Prevalence of physical abuse
Prevalence of neglect

Study

Zhao, 2004
Yang, 2004
Huang, 2006
Cai, 2008
Chang, 2008
Xie, 2008
Xiao, 2008
Zhu, 2010
Zhou, 2010
Zhang, 2010
Dong, 2010
Cheng, 2010
Gao, 2011
Zhu, 2012
Ma, 2012
Yang, 2012
Gao, 2013
Combined

.1  .3  .5  .7  .9
Prevalence of neglect
Fig. 3. Adjusted prevalence of childhood emotional abuse, physical abuse and neglect, China, 1988–2014

Note: The dashed vertical line represents the mean combined prevalence.