



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

Burden of Child Maltreatment in China

Citation for published version:

Fang, X, Fry, D, Ji, K, Finkelhor, D, Chen, J, Lannen, P & Dunne, M 2015, 'Burden of Child Maltreatment in China: a systematic review' Bulletin of the World Health Organization, vol. 93, no. 3, BLT.14.140970, pp. 176-185c. DOI: 10.2471/BLT.14.140970

Digital Object Identifier (DOI):

[10.2471/BLT.14.140970](https://doi.org/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:

© Fang, X., Fry, D., Ji, K., Finkelhor, D., Chen, J., Lannen, P., & Dunne, M. (2015). Burden of Child Maltreatment in China. Bulletin of the World Health Organization, 176-185c. [BLT.14.140970].

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,^a Deborah A Fry,^b Kai Ji,^c David Finkelhor,^c Jingqi Chen,^d Patricia Lannen^e & Michael P Dunne^f

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

^b University of Edinburgh, Edinburgh, Scotland.

^c Crimes Against Children Research Center, University of New Hampshire, Durham, United States of America.

^d Institute of Child and Adolescent Health, Peking University Health Science Center, Beijing, China.

^e Child Protection Program, UBS Optimus Foundation, Zurich, Switzerland.

^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.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.^{4,5}

In China, research in this field has a short history.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 sexual⁷⁻¹⁰ and physical abuse¹¹ and some more recent relevant data^{12,13} have been included in global and regional reviews.^{2,3,14,15} There has also been one systematic review that focused solely on the prevalence of child sexual abuse in China.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 *China* with *child*

Publication: Bulletin of the World Health Organization; Type: Systematic reviews
Article ID: BLT.14.140970
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.²¹ As girls are generally more likely to suffer sexual abuse than boys,³ 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.^{22–28} 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.²⁹ 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,³⁰ 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.¹⁸ 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.³¹

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.³²

Economic burden

We attempted to estimate the economic losses associated with child maltreatment in China. Following the work of the World Health Organization (WHO)³³ and Brown,³⁴ 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 study³⁰.

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,^{33,34} 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.³⁵

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,^{23,24,26–28,36–61} 36 studies on physical abuse,^{11,22–26,28,36–44,46,47,51–53,57,59–72} 18 studies on neglect^{23,27,28,36,43,44,46,47,49,50,53–56,59,73–75} and 16 studies on sexual abuse among females^{7–10,25,63,68,76–84} and 12 studies of sexual abuse among males.^{9,10,63,68,76,78–83,85} (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,^{23,24,26} physical abuse,^{22,23,25} and neglect.^{23,27,28} 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.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.^{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.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.⁵ 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.⁹⁴ 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

1. Gilbert R, Widom CS, Browne K, Fergusson D, Webb E, Janson S. Burden and consequences of child maltreatment in high-income countries. *Lancet*. 2009 Jan 3;373(9657):68–81. [http://dx.doi.org/10.1016/S0140-6736\(08\)61706-7](http://dx.doi.org/10.1016/S0140-6736(08)61706-7) PMID:19056114
2. Pereda N, Guilera G, Forns M, Gómez-Benito J. The international epidemiology of child sexual abuse: a continuation of Finkelhor (1994). *Child Abuse Negl*. 2009 Jun;33(6):331–42. <http://dx.doi.org/10.1016/j.chiabu.2008.07.007> PMID:19477003
3. Stoltenborgh M, van Ijzendoorn MH, Euser EM, Bakermans-Kranenburg MJ. A global perspective on child sexual abuse: meta-analysis of prevalence around the world. *Child Maltreat*. 2011 May;16(2):79–101. <http://dx.doi.org/10.1177/1077559511403920> PMID:21511741
4. Shonkoff JP, Boyce WT, McEwen BS. Neuroscience, molecular biology, and the childhood roots of health disparities: building a new framework for health promotion and disease prevention. *JAMA*. 2009 Jun 3;301(21):2252–9. <http://dx.doi.org/10.1001/jama.2009.754> PMID:19491187
5. Fang X, Brown DS, Florence CS, Mercy JA. The economic burden of child maltreatment in the United States and implications for prevention. *Child Abuse Negl*. 2012 Feb;36(2):156–65. <http://dx.doi.org/10.1016/j.chiabu.2011.10.006> PMID:22300910
6. Dunne MP, Chen JQ, Wan Yuen Choo. The evolving evidence base for child protection in Chinese societies. *Asia Pac J Public Health*. 2008;20(4):267–76. <http://dx.doi.org/10.1177/1010539508325047> PMID:19124321
7. Chen JQ, Dunne MP, Wang X. Prevalence of childhood sexual abuse among female students in a senior high school. *Chin J Sch Health*. 2002;23:108–10.[Chinese].
8. Chen J, Dunne MP, Han P. Child sexual abuse in Henan province, China: associations with sadness, suicidality, and risk behaviors among adolescent girls. *J Adolesc Health*. 2006 May;38(5):544–9. <http://dx.doi.org/10.1016/j.jadohealth.2005.04.001> PMID:16635765
9. Chen J, Dunne MP, Han P. Child sexual abuse in China: a study of adolescents in four provinces. *Child Abuse Negl*. 2004 Nov;28(11):1171–86. <http://dx.doi.org/10.1016/j.chiabu.2004.07.003> PMID:15567022
10. Tang CS. Childhood experience of sexual abuse among Hong Kong Chinese college students. *Child Abuse Negl*. 2002 Jan;26(1):23–37. [http://dx.doi.org/10.1016/S0145-2134\(01\)00306-4](http://dx.doi.org/10.1016/S0145-2134(01)00306-4) PMID:11860160
11. Ma YX, Chen JQ, Dunne MP, Liang YH, Cheng YJ, Wu CM, et al. The impact of childhood experience of being beaten by bare hands on adolescents' mental health. *Chin J Sch Health*. 2005;26(12):1001–3. [Chinese]
12. Leung PW, Wong WC, Chen WQ, Tang CS. Prevalence and determinants of child maltreatment among high school students in Southern China: a

large scale school based survey. *Child Adolesc Psychiatry Ment Health*. 2008;2(1):27. <http://dx.doi.org/10.1186/1753-2000-2-27>
PMID:18823544

13. Chan KL. Sexual violence against women and children in Chinese societies. *Trauma Violence Abuse*. 2009;10(1):69–85. PMID:19056687
14. Child maltreatment prevalence, incidence and consequences: a systematic review of research on child maltreatment in East Asia and Pacific. Bangkok: United Nations Children’s Fund East Asia and Pacific Regional Office; 2012.
15. Fry D, McCoy A, Swales D. The consequences of maltreatment on children’s lives: a systematic review of data from the East Asia and Pacific Region. *Trauma Violence Abuse*. 2012 Oct;13(4):209–33. <http://dx.doi.org/10.1177/1524838012455873> PMID:22899705
16. Ji K, Finkelhor D, Dunne M. Child sexual abuse in China: a meta-analysis of 27 studies. *Child Abuse Negl*. 2013 Sep;37(9):613–22. <http://dx.doi.org/10.1016/j.chiabu.2013.03.008> PMID:23643201
17. Chen JQ. [Review of prior research in China: child abuse and its impact on the victims]. *Zhonghua Er Ke Za Zhi*. 2006 Aug;44(8):625–8. [Chinese] PMID:17083797
18. Andrews G, Corry J, Slade T, Issakadis C, Swanston H. Child sexual abuse. In: Ezzati M, Lopez AD, Rodgers A, Murray C, editors. *Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors*. Geneva: World Health Organization; 2004.
19. Wells GA, Shea B, O’Connell D, Peterson J, Welch V, Losos M, et al. *The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses*. Ottawa: Ottawa Hospital Research Institute; 2014.
20. Boyle MH. Guidelines for evaluating prevalence studies. *Evid Based Ment Health*. 1998;1(2):37–9. <http://dx.doi.org/10.1136/ebmh.1.2.37>
21. Choo WY, Dunne MP, Marret MJ, Fleming M, Wong YL. Victimization experiences of adolescents in Malaysia. *J Adolesc Health*. 2011 Dec;49(6):627–34. <http://dx.doi.org/10.1016/j.jadohealth.2011.04.020> PMID:22098774
22. Fuh JL, Wang SJ, Juang KD, Lu SR, Liao YC, Chen SP. Relationship between childhood physical maltreatment and migraine in adolescents. *Headache*. 2010 May;50(5):761–8. <http://dx.doi.org/10.1111/j.1526-4610.2010.01639.x> PMID:20236341
23. Yang S, Zhang Y, Huang G, Guo G. A preliminary study on child abuse. *Chin J Clin Psychol*. 2004;12(2):140–1.
24. Lu X, Zhou M, Liang F, Ma X, Zhong Q. An investigation on child physical and emotional abuse of Zhuang and Han nationalities in western Guangxi. *J Youjiang Med Univ Natl*. 2012;34(4):453–4. [Chinese]
25. Qiu C, Ma Y. Sexual behavior and influence factors among 693 female technical secondary school students. *Chin J Sch Health*. 2010;31(4):417–8. [Chinese]

26. Chen J, Ma Y, Liang Y. A Retrospective Survey of Childhood Corporal Punishment and Emotional Maltreatment by Their Parents in Students. *Chin Ment Health J.* 2008;22(12):922–7. [Chinese]
27. Xie Z, Tang Q, Chang X, Deng Y. 457 College Students' experience of psychological abuse and neglect in childhood and mental health. *Chin J Clin Psychol.* 2008;16(1):62–5.
28. Ma JF, Dai JH, Guan SZ, Liu W, Liu JW. Retrospective study on the adverse childhood experience among medical college students. *Chin J Sch Health.* 2012;33(12):1454–6. [Chinese]
29. The World Factbook. East & Southeast Asia: China [Internet]. Washington: Central Intelligence Agency; 2014. Available from: <https://www.cia.gov/library/publications/the-world-factbook/geos/ch.html> [cited 2014 Nov 12].
30. Yang G, Wang Y, Zeng Y, Gao GF, Liang X, Zhou M, et al. Rapid health transition in China, 1990–2010: findings from the Global Burden of Disease Study 2010. *Lancet.* 2013 Jun 8;381(9882):1987–2015. [http://dx.doi.org/10.1016/S0140-6736\(13\)61097-1](http://dx.doi.org/10.1016/S0140-6736(13)61097-1) PMID:23746901
31. Zhang J, Yu KF. What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. *JAMA.* 1998 Nov 18;280(19):1690–1. <http://dx.doi.org/10.1001/jama.280.19.1690> PMID:9832001
32. Borenstein M, Hedges LV, Higgins JP, Rothstein HR. Introduction to meta-analysis. Chichester: John Wiley & Sons; 2011.
33. Macroeconomics and Health. Investing in health for economic development. Geneva: World Health Organization; 2001.
34. Brown DW. Economic value of disability-adjusted life years lost to violence: estimates for WHO Member States. *Rev Panam Salud Publica.* 2008 Sep;24(3):203–9. <http://dx.doi.org/10.1590/S1020-49892008000900007> PMID:19115548
35. World development indicator 2010 [Internet]. Washington: World Bank; 2011. Available from: <http://data.worldbank.org/data-catalog/world-development-indicators/wdi-2010> [cited 2014 Nov 12].
36. Huang G, Zhang Y, Zou S, Shen J, Xiang H, Zhao L. Plasma Neuropeptide-Y and Cognitive function in female intimates with childhood sexual abuse. *Chin J Psychiatry.* 2006;39(1):12–5. [Chinese]
37. Ding G, Chen Q, Wang D, Chen L, Chen X, Zhang J, et al. A survey on the medicos who were abused in their childhood and their dangerous behavior. *Med J West China.* 2007;19(3):423–5. [Chinese]
38. Zhao D, Li L. A survey on childhood abuse experience among 485 college students. *Chin J Dis Control Prev.* 2006;10(2):154–6. [Chinese]
39. Hu D, Jin L, Wang L. A study of violence against children and policy implications. *Zhejiang Academic Journal.* 2005;6:149–56. [Chinese]
40. Wang YH, Chen JQ. [Analysis on childhood abuse experience and the influencing factors among 1762 college students.] *Mod Prev Med.* 2012;39(18):4654–6. [Chinese].

41. Zhong Y, Lu X, Zhou M, Ma X. Medical nursing student abused in childhood cases analyzed retrospective survey. *J Youjiang Med Univ Natl.* 2012;34(3):358–9. [Chinese]
42. Lin R, Liu W, Zhang W, Liu W, Lin L, Wu J. Situation and influencing factors of abuse among children in Guangzhou. *CJCHC.* 2011;19(1):21–3. [Chinese]
43. Gao C, Dai F, Liu H. Impact of childhood abuse experience on mental health of middle school students. *Dis Surveill.* 2011;26(4):313–6. [Chinese]
44. Zeng Q, Wu Z, Zhu H, Zhou W, Huang W, Qiu M, et al. Childhood experience and romantic relationship of university students. *Chin J Sch Health.* 2010;31(11):1352–5. [Chinese]
45. Chen JQ, Liao W. Childhood humiliated experiences and its correlation with the mental health in technical secondary school students. *Chin J Sch Health.* 2005;26(5):355–7. [Chinese]
46. Cai X. A study of child abuse among Meng and Han Meng. *J Chifeng Univ.* 2008;24(5):179–80. [Nat Sci Ed] [Chinese]
47. Zhao X, Zhang Y, Li L. Childhood abuse an investigation of 435 middle school students. *Chin J Clin Psychol.* 2004;12(4):377–9. [Chinese].
48. Chen J, Liao W. The relationship between humiliating experience in childhood and mental health among 430 high school students in Beijing. In: *The Symposium of the Third Conference of China Association of Health Promotion and Education*; 2011 Dec 7–11; Xiamen City, China. Beijing: China Association of Health Promotion and Education; 2011. p. 458-61.
49. Zhu M, Xu X, Su S, Lin D. Moderating effects of social support on the associations between depression and psychological abuse and neglect of Chinese junior high school students. In: *Proceedings of 2010 International Conference on Psychology, Psychological Sciences and Computer Science (PPSCS)*; 2010 Nov 27–28; Wuhan, China. Beijing: Institute of Electrical and Electronics Engineers; 2010. p. 121-6.
50. Zhou S, Liu Q, Zhu H, Guo Z, Shem J. Childhood psychological abuse and neglect: An investigation of 397 senior high school students. *Guide China Med.* 2010;8(25):16–8. [Chinese]
51. Yan QQ, Jiao WY, Lin J, Jiao FY. [Effect of childhood physical and emotional abuse on psychological health in undergraduate students]. *Zhongguo Dang Dai Er Ke Za Zhi.* 2009 Aug;11(8):675–8. [Chinese] PMID:19695200
52. Yong N, Wang H, Hu H, Meng HQ, Chen P, Du L, et al. Relationship among child-abuse, depressive symptoms and sleep quality in grade 4-6 primary students. *Chin Ment Health J.* 2011;25(8):616–20. [Chinese]
53. Zhu X, Wang C, Zhou Q, Qiao J, Geng D, Li J. Characteristics of big five personality in college students and its relationship with childhood abuse. *China J Health Psychol.* 2012;20(7):1083–6. [Chinese]

54. Yang W. The psychological abuse and neglect of children and their loneliness: the mediating effect of self. *Chin J Spec Educ.* 2012;12(150):64–9. [Chinese]
55. Dong F, Cao F, Guo Y, Kong Z, Li Y, Cheng P, et al. Prevalence and relationship between psychological abuse & neglect and internet addiction in junior middle school students. *CJCHC.* 2010;18(10):761–3.
56. Chang X, Wang H. Effect of psychological abused and neglect in childhood on adult mental health. *Chin J Health Psychol.* 2008;16(11):1239–41. [Chinese]
57. Tao FB, Huang K, Kim S, Ye Q, Sun Y, Zhang CY, et al. [Correlation between psychopathological symptoms, coping style in adolescent and childhood repeated physical, emotional maltreatment]. *Zhonghua Er Ke Za Zhi.* 2006 Sep;44(9):688–93. [Chinese] PMID:17217665
58. Hou Y, Zhao J, Yang X. Relationship among parents' emotional abuse of college students and their security, anxiety and purpose of life. *China J Health Psychol.* 2010;18(10):1262–4. [Chinese]
59. Xiao Q, Dong MX, Yao J, Li WX, Ye DQ. Parental alcoholism, adverse childhood experiences, and later risk of personal alcohol abuse among Chinese medical students. *Biomed Environ Sci.* 2008 Oct;21(5):411–9. [http://dx.doi.org/10.1016/S0895-3988\(08\)60062-8](http://dx.doi.org/10.1016/S0895-3988(08)60062-8) PMID:19133615
60. Li X, Wang Z, Hou Y, Wang Y, Liu J, Wang C. Effects of childhood trauma on personality in a sample of Chinese adolescents. *Child Abuse Negl.* 2014 Apr;38(4):788–96. <http://dx.doi.org/10.1016/j.chiabu.2013.09.002> PMID:24161247
61. Chen J. Childhood physical and emotional maltreatment and its psychological effects in 391 university students in China. *Chin J Sch Doctor.* 2005;19(4):341–4. [Chinese]
62. Samuda GM. Child discipline and abuse in Hong Kong. *Child Abuse Negl.* 1988;12(2):283–7. [http://dx.doi.org/10.1016/0145-2134\(88\)90036-1](http://dx.doi.org/10.1016/0145-2134(88)90036-1) PMID:3395901
63. Ye Q, Tao F, Fang D, Huang K, Sun Y. Impact of child abuses on psychology and risk behaviors regarding harmful dietary patterns in adolescents. *Chin J Epidemiol.* 2006;27(4):319–23. [Chinese]
64. Yen CF, Yang MS, Yang MJ, Su YC, Wang MH, Lan CM. Childhood physical and sexual abuse: prevalence and correlates among adolescents living in rural Taiwan. *Child Abuse Negl.* 2008 Mar;32(3):429–38. <http://dx.doi.org/10.1016/j.chiabu.2007.06.003> PMID:18308392
65. Chen JQ, Wu CM, Dunne MP, Ma YX, Chen B, Liang YH, et al. [A retrospective survey of childhood corporal punishment by school teachers in students]. *Zhonghua Er Ke Za Zhi.* 2006 Jan;44(1):26–30. [Chinese] PMID:16624000
66. Chou CY, Su YJ, Wu HM, Chen SH. Child physical abuse and the related PTSD in Taiwan: The role of Chinese cultural background and victims' subjective reactions. *Child Abuse Negl.* 2011 Jan;35(1):58–68. <http://dx.doi.org/10.1016/j.chiabu.2010.08.005> PMID:21334068

67. Hester M, He J, Tian L. Girls' and boys' experiences and perceptions of parental discipline and punishment while growing up in China and England. *Child Abuse Rev.* 2009;18(6):401–13.
<http://dx.doi.org/10.1002/car.1095>
68. Chan KL, Yan E, Brownridge DA, Ip P. Associating child sexual abuse with child victimization in China. *J Pediatr.* 2013 May;162(5):1028–34.
<http://dx.doi.org/10.1016/j.jpeds.2012.10.054> PMID:23219443
69. Shen AC. Long-term effects of interparental violence and child physical maltreatment experiences on PTSD and behavior problems: a national survey of Taiwanese college students. *Child Abuse Negl.* 2009 Mar;33(3):148–60. <http://dx.doi.org/10.1016/j.chiabu.2008.07.006>
PMID:19327836
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]
71. Chen J, Liao W. Childhood non-contact corporal punishment revealed in the questionnaire survey of technical secondary school students. *Chin Ment Health J.* 2005;19(4):243–6. [Chinese]
72. Xiao Y, Tao F, Xu SJ, Su P, Huang C. Self- injurious behaviors in adolescents with repeated childhood abuse. *Chin J Publ Health.* 2008;24(9):1028–30. [Chinese]
73. Gao Y, Pan J, Yang W, Teng H, Ying Y. Cross sectional study on child neglect among rural children aged 9-11 years in Shanxi Province. *J Medl Theor Pract.* 2013;26(20):2680–5. [Chinese]
74. Zhang H, Pan J, Cao C, Luo S, Zhang S. Analysis of state of high school students neglect for aged 12-17 years in urban China. *Chin J Women Child Health.* 2010;1(2):S76–80. [Chinese]
75. Cheng P, Cao F, Chen Q, Liu J, Li Y, Kong Z, et al. Prevalence and influencing factors of juvenile victimization. *CJCHC.* 2010;18(6):479–81. [Chinese].
76. Lin D, Li X, Fan X, Fang X. Child sexual abuse and its relationship with health risk behaviors among rural children and adolescents in Hunan, China. *Child Abuse Negl.* 2011 Sep;35(9):680–7.
<http://dx.doi.org/10.1016/j.chiabu.2011.05.006> PMID:21907409
77. Chen JQ, Han P, Dunne MP. [Child sexual abuse: a study among 892 female students of a medical school]. *Zhonghua Er Ke Za Zhi.* 2004 Jan;42(1):39–43. [Chinese] PMID:14990105
78. Gu L, Chi S, Zhang Z. A study of child sexual abuse among college students. *Chin J Sch Health.* 2005;26(4):309–10. [Chinese]
79. Chen J, Ma Y, Cheng Y, Chen B, Liang Y. A survey on the occurrence and influencing factors of childhood sexual abuse among adolescent students. *Chin J Hum Sex.* 2006;15(8):3–7. [Chinese]
80. Chen JQ, Han P, Lian GL, Dunne MP. [Prevalence of childhood sexual abuse among 2508 college students in 6 provinces of China]. *Zhonghua Liu Xing Bing Xue Za Zhi.* 2010 Aug;31(8):866–9. [Chinese] PMID:21162984

81. Su PY, Tao FB, Cao XJ. [Study on the relationship between sexual abuse in childhood and psychiatric disorder, risky behaviors in youthhood among 1386 medicos]. *Zhonghua Liu Xing Bing Xue Za Zhi*. 2008 Jan;29(1):94–5. [Chinese] PMID:18785490
82. Sun D, Sun Y, Duan Y, Chou L, Liu C. Childhood sexual abuse among female students in a high vocational college. *Chin J Sch Health*. 2006;27(5):400–1. [Chinese]
83. Chen JQ. [A retrospective survey in child sexual abuse among 565 university students]. *Zhonghua Liu Xing Bing Xue Za Zhi*. 2004 Oct;25(10):873–7.[Chinese]. PMID:15631745
84. Chen J, Dunne MP. The impact of sexual abuse in childhood on females' mental development. *Chin J Publ Health*. 2003;19(9):1142–3. [Chinese]
85. Chen J, Wang X, Dunne MP. Childhood sexual abuse: An investigation among 239 male high school students. *Chin Ment Health J*. 2003;17(5):345–7. [Chinese]
86. Cheng HG, Huang Y, Anthony JC. Childhood physical punishment and later alcohol drinking consequences: evidence from a Chinese context. *J Stud Alcohol Drugs*. 2011 Jan;72(1):24–33. PMID:21138708
87. Cong E, Li Y, Shao C, Chen J, Wu W, Shang X, et al. Childhood sexual abuse and the risk for recurrent major depression in Chinese women. *Psychol Med*. 2012 Feb;42(2):409–17.
<http://dx.doi.org/10.1017/S0033291711001462> PMID:21835095
88. Lau JT, Chan KK, Lam PK, Choi PY, Lai KY. Psychological correlates of physical abuse in Hong Kong Chinese adolescents. *Child Abuse Negl*. 2003 Jan;27(1):63–75. [http://dx.doi.org/10.1016/S0145-2134\(02\)00507-0](http://dx.doi.org/10.1016/S0145-2134(02)00507-0) PMID:12510031
89. Lau JT, Kim JH, Tsui HY, Cheung A, Lau M, Yu A. The relationship between physical maltreatment and substance use among adolescents: a survey of 95,788 adolescents in Hong Kong. *J Adolesc Health*. 2005 Aug;37(2):110–9.
<http://dx.doi.org/10.1016/j.jadohealth.2004.08.005> PMID:16026720
90. Li N, Ahmed S, Zabin LS. Association between childhood sexual abuse and adverse psychological outcomes among youth in Taipei. *J Adolesc Health*. 2012 Mar;50(3) Suppl:S45–51.
<http://dx.doi.org/10.1016/j.jadohealth.2011.12.003> PMID:22340856
91. So-Kum Tang C, Wong WC, Leung PM, Chen WQ, Lee A, Ling DC. Health compromising behaviors among Chinese adolescents: role of physical abuse, school experience, and social support. *J Health Psychol*. 2011 Apr;16(3):457–66.
<http://dx.doi.org/10.1177/1359105310384297> PMID:21224331
92. Gershoff E, Lansford J, Sexton H, Davis-Kean P, Sameroff A. Longitudinal links between spanking and children's external behaviours in a national sample of white, black and Hispanic and Asian families. *Child Dev*. 2012;83:1–6. <http://dx.doi.org/10.1111/j.1467-8624.2011.01732.x>

93. Hoeve M, Dubas JS, Eichelsheim VI, van der Laan PH, Smeenk W, Gerris JR. The relationship between parenting and delinquency: a meta-analysis. *J Abnorm Child Psychol.* 2009 Aug;37(6):749–75.
<http://dx.doi.org/10.1007/s10802-009-9310-8> PMID:19263213
94. Health statistics and information systems. Estimates for 2000–2012 [Internet]. Geneva: World Health Organization; 2014. Available from: http://www.who.int/healthinfo/global_burden_disease/estimates/en/index1.html [cited 2014 Nov 12].

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

| Study | Type of study | Maltreatment | Sample size | Risk of bias | Excluded maltreatment in meta-analysis | RR estimation, maltreatment – outcome |
|-----------------------------------|-----------------------------|------------------------------|--------------------|---------------------|---|---|
| Cai (2008) ⁴⁶ | Prevalence | Emotional, physical, neglect | 270 | Low | – | – |
| Chan & Yan (2013) ⁶⁸ | Prevalence | Physical, sexual | 18 341 | Low | – | – |
| Chang & Wang (2008) ⁵⁶ | Prevalence | Emotional, neglect | 230 | Medium | – | – |
| Chen & Dunne (2003) ⁸⁴ | Prevalence | Sexual | 323 | Low | – | – |
| Chen & Liao (2011) ⁴⁸ | Prevalence | Emotional | 430 | Medium | – | – |
| Chen & Liao (2005) ⁴⁵ | Prevalence | Emotional | 484 | Medium | – | – |
| Chen & Liao (2005) ⁷¹ | Prevalence | Physical | 484 | Medium | – | – |
| Chen et al. (2003) ⁸⁵ | Prevalence | Sexual | 239 | Low | – | – |
| Chen et al. (2006) ⁶⁵ | Prevalence and consequences | Physical | 528 | Medium | – | Physical – current smoker Physical – problem drinking |
| Chen et al. (2006) ⁷⁹ | Prevalence | Sexual | 528 | Low | – | – |
| Chen et al. (2010) ⁸⁰ | Prevalence | Sexual | 2 508 | Low | – | – |
| Chen (2004) ⁸³ | Prevalence | Sexual | 565 | Medium | – | – |
| Chen (2005) ⁶¹ | Prevalence | Emotional, physical | 291 | Medium | – | – |
| Chen et al. (2004) ⁹ | Prevalence and consequences | Sexual | 2 300 | Low | – | Sexual – current smoker Sexual – problem drinking |
| Chen et al. (2006) ⁸ | Prevalence and consequences | Sexual | 351 | Low | – | Sexual – current smoker Sexual – problem drinking |
| Chen et al. (2002) ⁷ | Prevalence | Sexual | 985 | Medium | – | – |
| Chen et al. (2004) ⁷⁷ | Prevalence | Sexual | 892 | Medium | – | – |
| Chen et al. (2008) ²⁶ | Prevalence | Emotional, physical | 528 | Medium | Emotional | – |
| Cheng et al. (2010) ⁷⁵ | Prevalence | Neglect | 3 155 | Low | – | – |
| Cheng et al. (2011) ⁸⁶ | Consequences | Physical | 1 628 | Low | – | Physical – current smoker Physical – problem drinking Physical – illicit drug use |
| Cong et al. (2012) ⁸⁷ | Consequences | Sexual | 4 567 | Low | – | Sexual – depression |
| Chou et al. (2011) ⁶⁶ | Prevalence | Physical | 1 966 | Low | – | – |
| Ding et al. (2007) ³⁷ | Prevalence | Emotional, physical | 485 | Medium | – | – |
| Dong et al. (2010) ⁵⁵ | Prevalence | Emotional, neglect | 1 193 | Low | – | – |
| Fuh et al. (2010) ²² | Prevalence | Physical | 4 259 | Medium | Physical | – |

| | | | | | | |
|---|-----------------------------|------------------------------|--------|--------|-----------|---|
| Gao et al. (2011) ⁴³ | Prevalence | Emotional, physical, neglect | 301 | Medium | – | – |
| Gao et al. (2013) ⁷³ | Prevalence | Neglect | 685 | Low | – | – |
| Gu et al. (2005) ⁷⁸ | Prevalence | Sexual | 1 635 | Medium | – | – |
| Hester et al. (2009) ⁶⁷ | Prevalence | Physical | 498 | Medium | – | – |
| Hou et al. (2010) ⁵⁸ | Prevalence | Emotional | 757 | Medium | – | – |
| Hu et al. (2005) ³⁹ | Prevalence | Emotional, physical | 336 | Medium | – | – |
| Huang et al. (2006) ³⁶ | Prevalence | Emotional, physical, neglect | 335 | Medium | – | – |
| Lau et al. (2003) ⁸⁸ | Consequences | Physical | 489 | Low | – | Physical – current smoker Physical – self harm |
| Lau et al. (2005) ⁸⁹ | Consequences | Physical | 95 788 | Low | – | Physical – current smoker Physical – illicit drug use |
| Li et al. (2012) ⁹⁰ | Consequences | Sexual | 4 084 | Low | – | Sexual – depression Sexual – anxiety |
| Li et al. ^a (2014) ⁶⁰ | Prevalence | Emotional, physical | 485 | Low | – | – |
| Lin et al. (2011) ⁴² | Prevalence | Emotional, physical | 7 475 | Low | – | – |
| Lin et al. (2011) ⁷⁶ | Prevalence | Sexual | 683 | Low | – | – |
| Lu et al. (2012) ²⁴ | Prevalence | Emotional, physical | 796 | Medium | Emotional | – |
| Ma & Chen (2007) ⁷⁰ | Prevalence and consequences | Physical | 709 | Medium | – | Physical – mental disorder Physical – depression Physical – anxiety |
| Ma et al. (2005) ¹¹ | Prevalence and consequences | Physical | 528 | Medium | – | Physical – current smoker Physical – problem drinking Physical – mental disorder Physical – depression Physical – anxiety |
| Ma et al. (2012) ²⁸ | Prevalence | Emotional, physical, neglect | 475 | Low | Neglect | – |
| Qiu & Ma (2010) ²⁵ | Prevalence | Physical, sexual | 709 | Medium | Physical | – |
| Samuda (1988) ⁶² | Prevalence | Physical | 100 | Medium | – | – |
| Shen (2009) ⁶⁹ | Prevalence | Physical | 1 924 | Low | – | – |
| Su et al. (2008) ⁸¹ | Prevalence and consequences | Sexual | 1 386 | Medium | – | Sexual – depression Sexual – anxiety Sexual – self harm |
| Sun et al. (2006) ⁸² | Prevalence | Sexual | 701 | Medium | – | – |
| Tang (2002) ¹⁰ | Prevalence | Sexual | 2 147 | Medium | – | – |

| | | | | | | |
|-----------------------------------|-----------------------------|------------------------------|--------|--------|------------------------------|---|
| Tang et al. (2011) ⁹¹ | Consequences | Physical | 6 564 | Low | – | Physical – current smoker Physical – self harm |
| Tao et al. (2006) ⁵⁷ | Prevalence and consequences | Emotional, physical | 5 141 | Medium | – | Physical – mental disorder Emotional – mental disorder |
| Wang & Chen (2012) ⁴⁰ | Prevalence | Emotional, physical | 1 762 | Medium | – | – |
| Xiao et al. (2008) ⁷² | Prevalence and consequences | Physical | 10 894 | Medium | – | Physical – self harm Emotional – self harm |
| Xiao (2008) ⁵⁹ | Prevalence | Emotional, physical, neglect | 2 073 | Low | – | – |
| Xie et al. (2008) ²⁷ | Prevalence | Emotional, neglect | 457 | Low | Neglect | – |
| Yan et al. (2009) ⁵¹ | Prevalence | Emotional, physical | 1 200 | Low | – | – |
| Yang et al. (2004) ²³ | Prevalence | Emotional, physical, neglect | 282 | Medium | Emotional, physical, neglect | – |
| Yang (2012) ⁵⁴ | Prevalence | Emotional, neglect | 324 | Low | – | – |
| Ye et al. (2006) ⁶³ | Prevalence | Physical, sexual | 5 141 | Medium | – | – |
| Yen et al. (2008) ⁶⁴ | Prevalence | Physical | 1 684 | Low | – | – |
| Yong et al. (2011) ⁵² | Prevalence | Emotional, physical | 1 417 | Low | – | – |
| Zeng et al. (2010) ⁴⁴ | Prevalence | Emotional, physical, neglect | 667 | Low | – | – |
| Zhang et al. (2010) ⁷⁴ | Prevalence | Neglect | 3 539 | Low | – | – |
| Zhao & Li (2006) ³⁸ | Prevalence | Emotional, physical | 485 | Medium | – | – |
| Zhao et al. (2004) ⁴⁷ | Prevalence | Emotional, physical, neglect | 435 | Low | – | – |
| Zhong et al. (2012) ⁴¹ | Prevalence | Emotional, physical | 456 | Medium | – | – |
| Zhou et al. (2010) ⁵⁰ | Prevalence | Emotional, neglect | 397 | Low | – | – |
| Zhu et al. (2010) ⁴⁹ | Prevalence | Emotional, neglect | 659 | Low | – | – |
| Zhu et al. (2012) ⁵³ | Prevalence | Emotional, physical, neglect | 2 374 | Low | – | – |

RR: relative risk.

^a 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, <i>Q</i> | Prevalence, % (95% CI) | No. of studies | Heterogeneity, <i>Q</i> |
| 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 | | | – ^e | – | – |
| 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

| Type of maltreatment ^a | Mental disorder | | Depression | | Anxiety | | Current smoker | | Problem drinking | | Illicit drug use | | Self-harm | |
|-----------------------------------|-----------------|--------|------------|--------|---------|--------|----------------|--------|------------------|--------|------------------|------|-----------|--------|
| | RR ^b | PAF, % | RR | PAF, % | RR | PAF, % | RR | PAF, % | RR | PAF, % | RR | PAF | RR | PAF, % |
| Physical abuse | 1.87 | 18.8 | 1.52 | 12.2 | 1.77 | 17.0 | 1.40 | 9.6 | 1.98 | 20.7 | 1.87 | 18.8 | 1.84 | 18.3 |
| Emotional abuse | 2.82 | 26.3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1.84 | 14.1 |
| Sexual abuse | NA | NA | 1.66 | 5.4 | 1.53 | 4.4 | 2.08 | 8.6 | 2.07 | 8.5 | NA | NA | 2.39 | 10.8 |

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

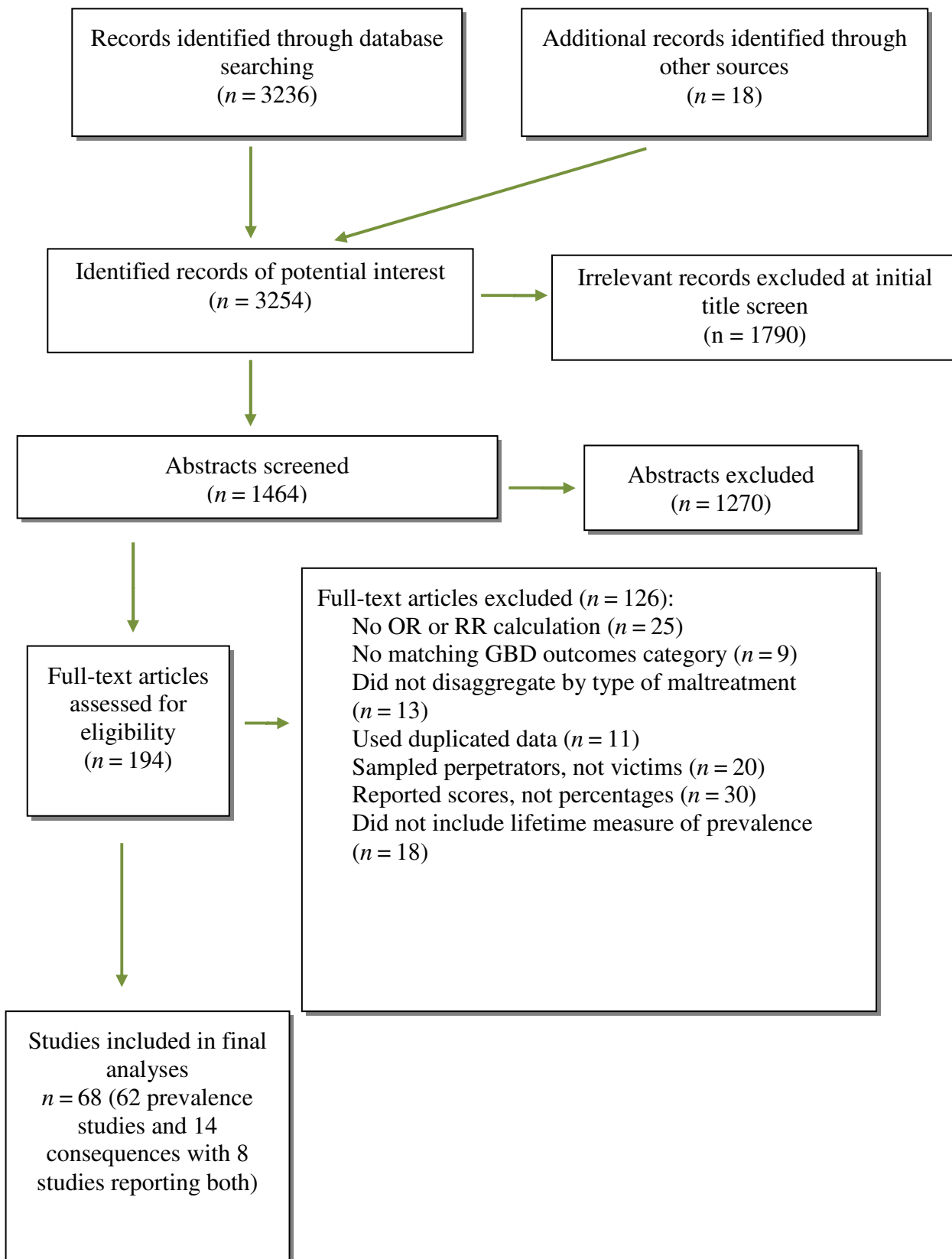
| Outcome of maltreatment | Physical abuse | | | Emotional abuse | | | Sexual abuse | | |
|-------------------------|-----------------------------|-----------------------------|-------------------------|--------------------|-----------------------------|-------------|--------------------|-----------------------------|-------------|
| | DALYs lost (x1000) | Value lost Millions of US\$ | % of GDP | DALYs lost (x1000) | Value lost Millions of US\$ | % of GDP | DALYs lost (x1000) | Value lost Millions of US\$ | % of GDP |
| Mental disorder | 3924.5 | 17 399.1 | 0.29 | 5490.8 | 24 342.7 | 0.41 | NA | NA | NA |
| Depression | 1429.9 | 6339.2 | 0.11 | NA | NA | NA | 639.0 | 2832.9 | 0.05 |
| Anxiety | 490.5 | 2174.4 | 0.04 | NA | NA | NA | 127.2 | 563.8 | 0.01 |
| Current smoker | 2885.5 | 12 792.6 | 0.22 | NA | NA | NA | 2577.1 | 11 425.4 | 0.19 |
| Problem drinking | 2849.4 | 12 632.5 | 0.21 | NA | NA | NA | 1173.5 | 5202.8 | 0.09 |
| Illicit drug use | 538.4 | 2387.0 | 0.04 | NA | NA | NA | NA | NA | NA |
| Self-harm | 1090.3 | 4833.7 | 0.08 | 843.9 | 3741.5 | 0.06 | 644.1 | 2855.4 | 0.05 |
| Total | 11 288.1^a | 50045.0^a | 0.84^a | 6334.7 | 28 084.2 | 0.47 | 5160.9 | 22 880.3 | 0.39 |

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.

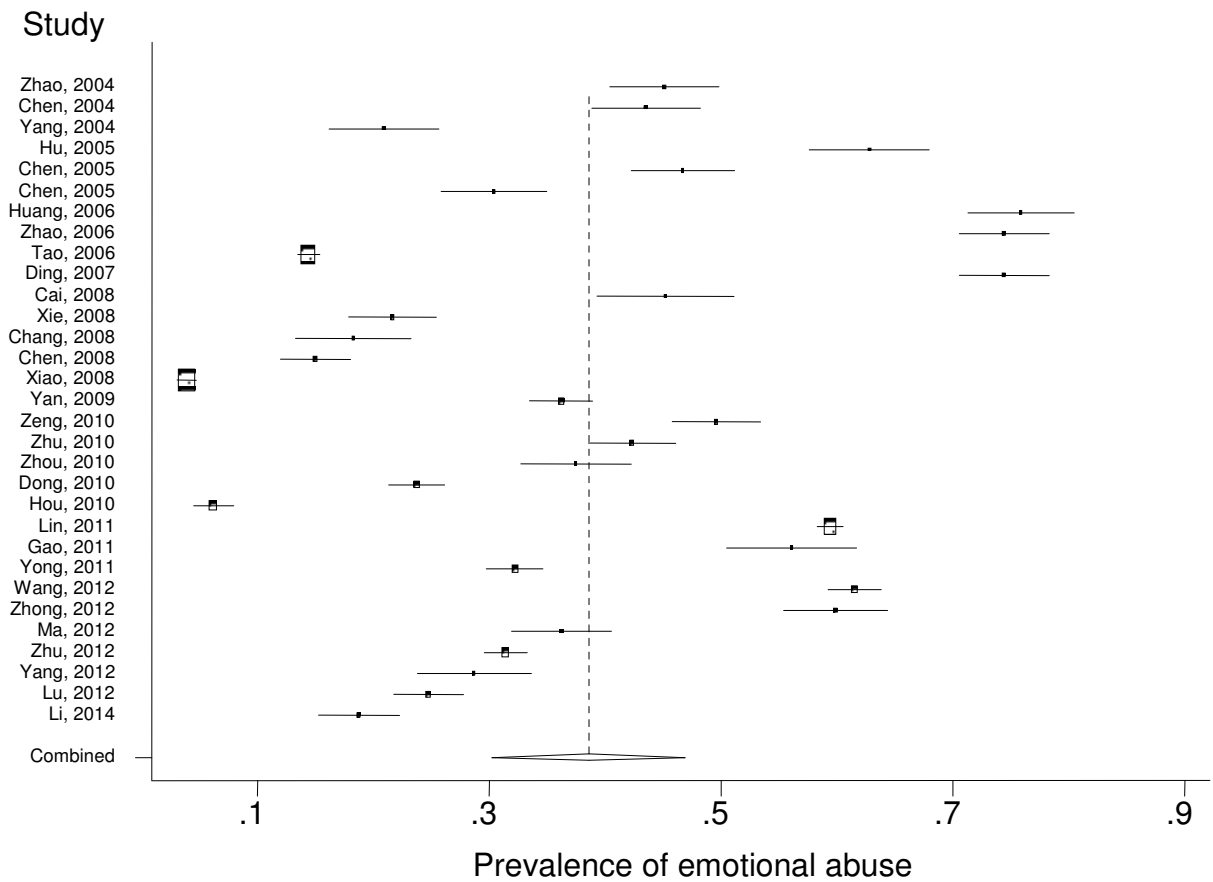
Note: Inconsistencies arises in some values due to rounding.

Fig. 1. Flowchart for the selection of studies included in the systematic review on child maltreatment in China

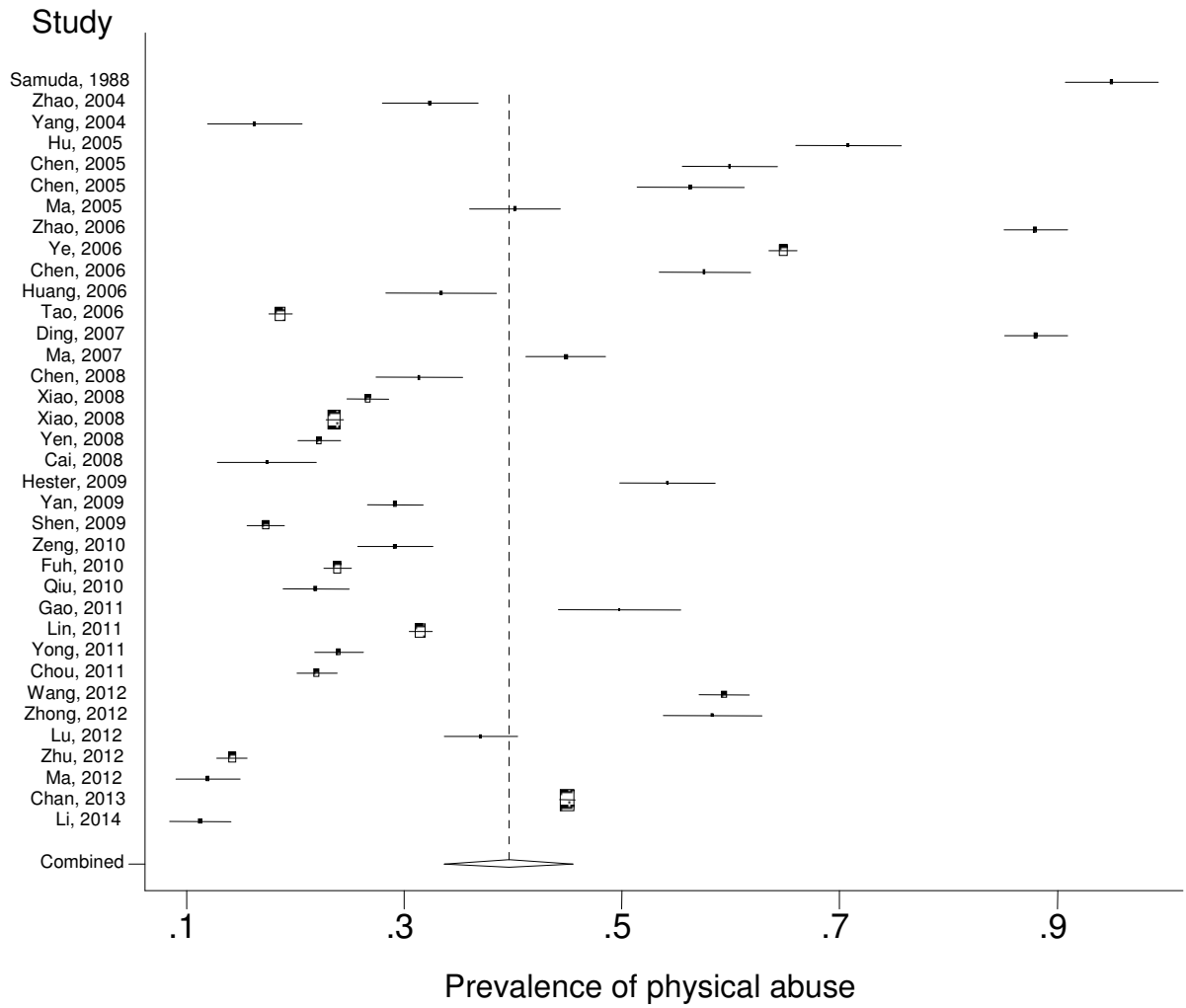


GBD: Global Burden of Disease; OR: odds ratio; RR: relative risk.

Fig. 2. Studies reporting unadjusted prevalence for childhood emotional abuse, physical abuse and neglect, China, 1988–2014



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



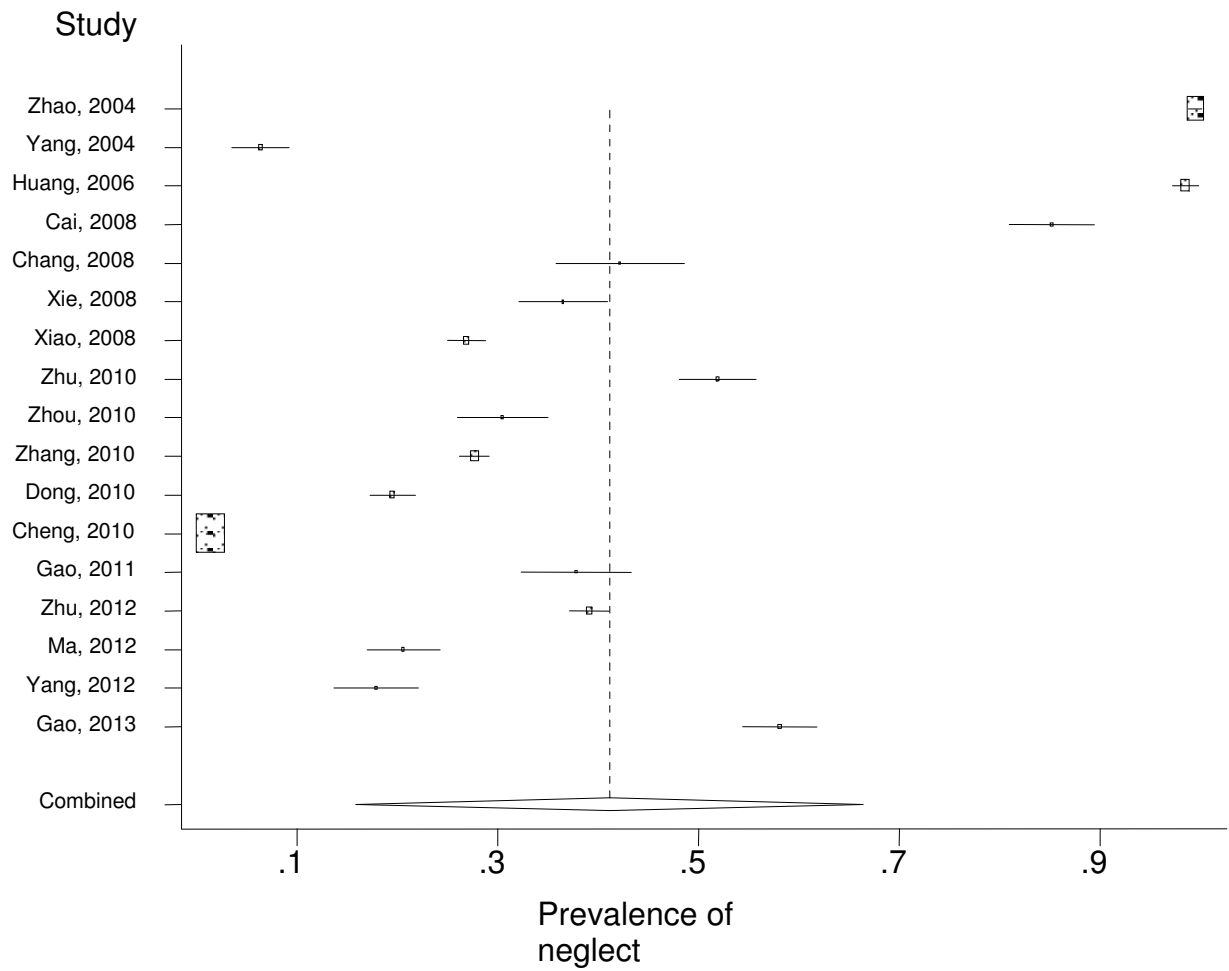
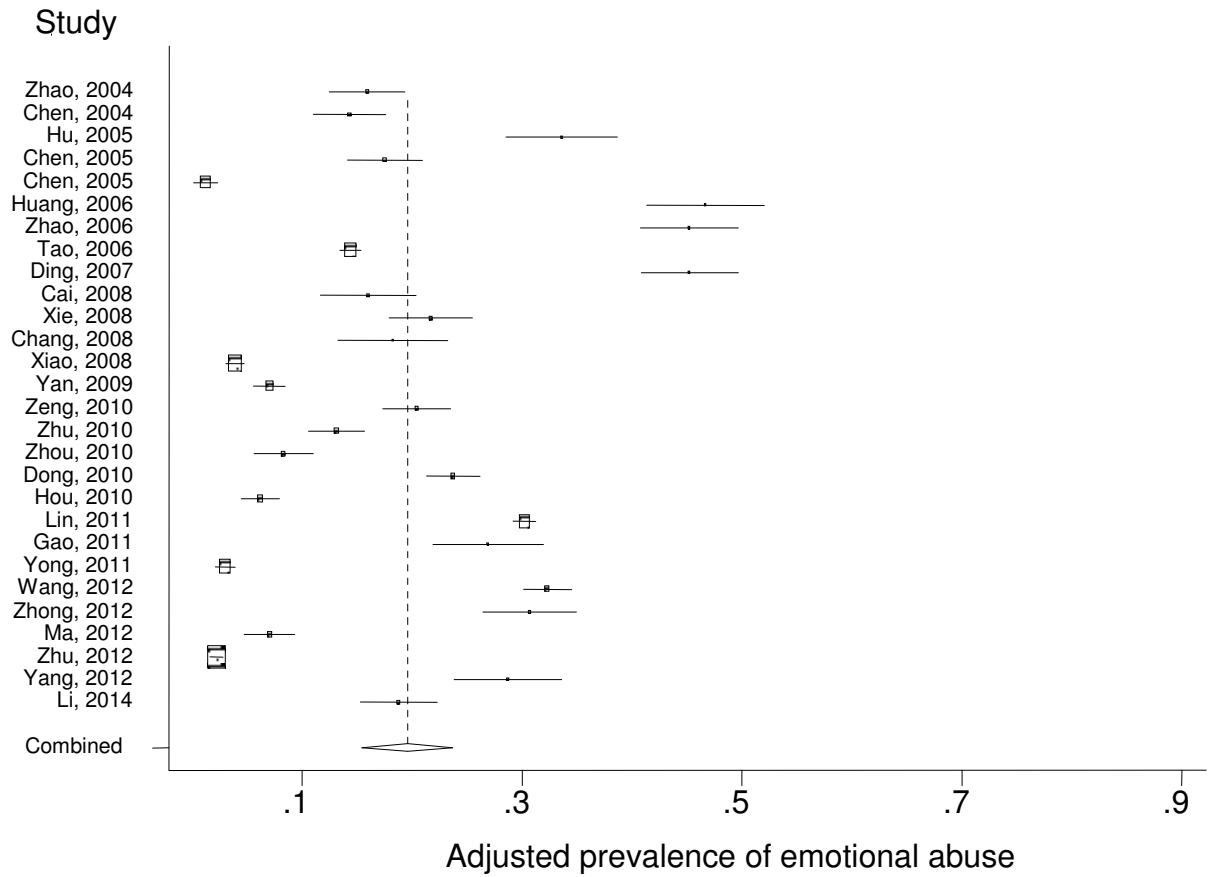


Fig. 3. **Adjusted prevalence of childhood emotional abuse, physical abuse and neglect, China, 1988–2014**



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