

A cross-sectional assessment of the burden of mild asthma in urban China using the 2010, 2012, and 2013 China National Health and Wellness Surveys

Bo Ding, PhD¹; Marco DiBonaventura, PhD²; Niklas Karlsson, PhD³; Xia Ling, MD⁴

¹AstraZeneca, Gothenburg, Sweden; ²Kantar Health, New York, NY, USA; ³AstraZeneca, Mölndal, Sweden;

⁴AstraZeneca, Shanghai, China

Introduction

- Studies have estimated the prevalence of asthma in China to be between **0.73%** and **1.80%** [To 2012; Wang 2013; Zhang 2014; Zhang 2015]
 - Prevalence varies significantly by region (e.g. urban vs. rural) [Zhang 2014]
- However, limited data exist on the prevalence of different asthma severity levels in China and the effect of asthma on patient outcomes



Objectives

- To estimate prevalence of asthma (with an emphasis on **mild asthma**) in urban China using a general population health survey
- To examine the association between asthma severity (with an emphasis on **mild asthma**) and quality of life (QOL), work impairment, and healthcare resource use (HCRU)



Data source

- Data from the 2010 (N=19,954), 2012 (N=19,994), and 2013 (N=19,987) China National Health and Wellness Survey (NHWS)
 - NHWS is a general health survey administered primarily online with some offline recruiting
 - Sampling mimics the demographic composition of urban China
 - 3 years of NHWS were combined to maximize sample size for those with asthma
- Total sample size was **N=59,935**



Key measures

- **Asthma severity**

- Definition 1: Self-reported (“*How severe is your asthma?*” - “mild” vs. “moderate”/“severe”)
- Definition 2: GINA2014 guidelines based on current self-reported medication use (Step 1/2 = “mild” vs. Step 3/4/5 = “moderate”/“severe”)

- **Demographics**

- Age, sex, income, education

- **Health history**

- Smoking, alcohol intake, exercise, body mass index

- **Comorbidities**

- Charlson comorbidity index

- **Health outcomes**

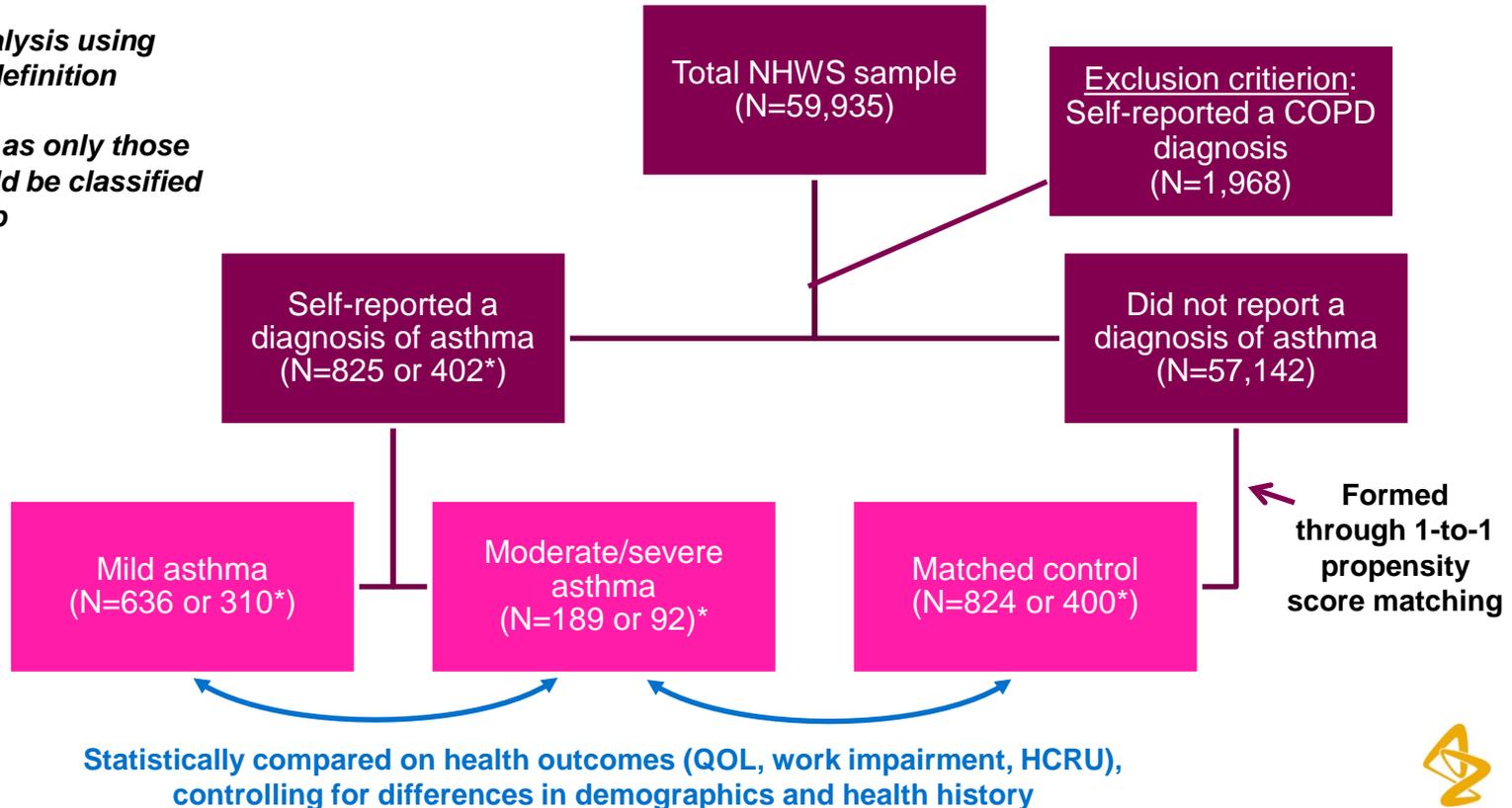
- QOL (Short Form 12/36-v2)
- Work impairment (WPAI-GH)
- Self-reported HCRU



Study flow chart and analysis

**Sample size for analysis using
GINA2014 severity definition*

*Lower sample sizes as only those
treated (N=402) could be classified
into a severity group*



Sample characteristics

	Self-report definition		GINA2014 guidelines definition	
	Mild (N=636)	Moderate/ Severe (N=189)	Mild (N=310)	Moderate/ Severe (N=92)
Age	43.16 ± 14.71	44.43 ± 14.35	44.04 ± 14.46	42.96 ± 13.50
Male (N, %)	366 (57.55%)	109 (57.67%)	175 (56.45%)	52 (56.52%)
University educated (N, %)	382 (60.06%)	124 (65.61%)	197 (63.55%)	69 (75.00%)
Smoking habits				
Never smoked	310 (48.74%)	71 (37.57%)	134 (43.23%)	33 (35.87%)
Former smoker	88 (13.84%)	20 (10.58%)	49 (15.81%)	14 (15.22%)
Current smoker	238 (37.42%)	98 (51.85%)	127 (40.97%)	45 (48.91%)
CCI	0.61 ± 0.91	1.05 ± 2.00	0.72 ± 1.19	1.02 ± 1.50

CCI = Charlson comorbidity index



Prevalence of mild asthma

- **N=1,191** respondents reported an asthma diagnosis (**2.01%** of the total adult population)

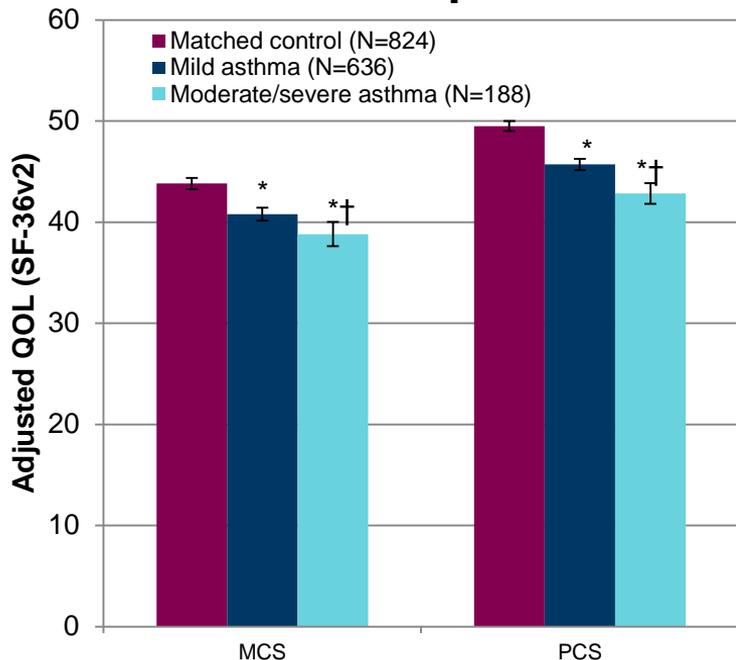
	Self-report definition	GINA2014 guidelines definition
Among adults	1.52%	0.77%
Among patients with asthma	75.72%	77.22%

*Results weighted to project to the total adult urban population of China
Analyses were performed prior to excluding patients with COPD*

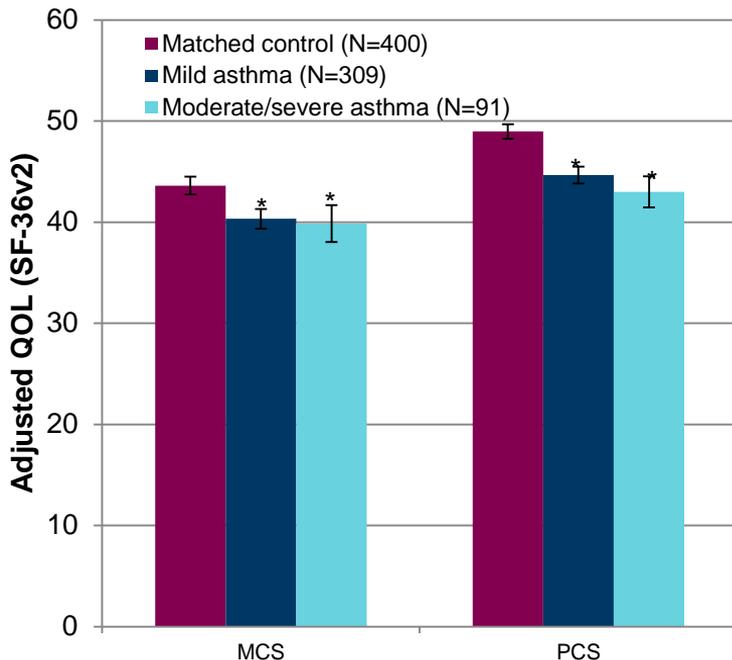


Mild and moderate/severe asthma had significantly worse QOL than matched controls. No QOL differences were observed between mild and moderate/severe asthma defined by GINA2014 guidelines.

Self-report



GINA2014 guidelines



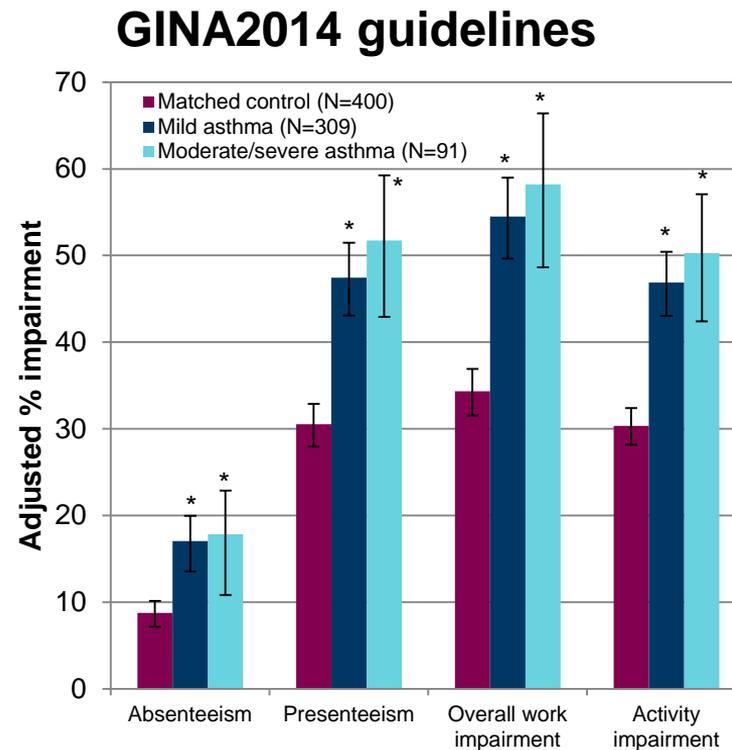
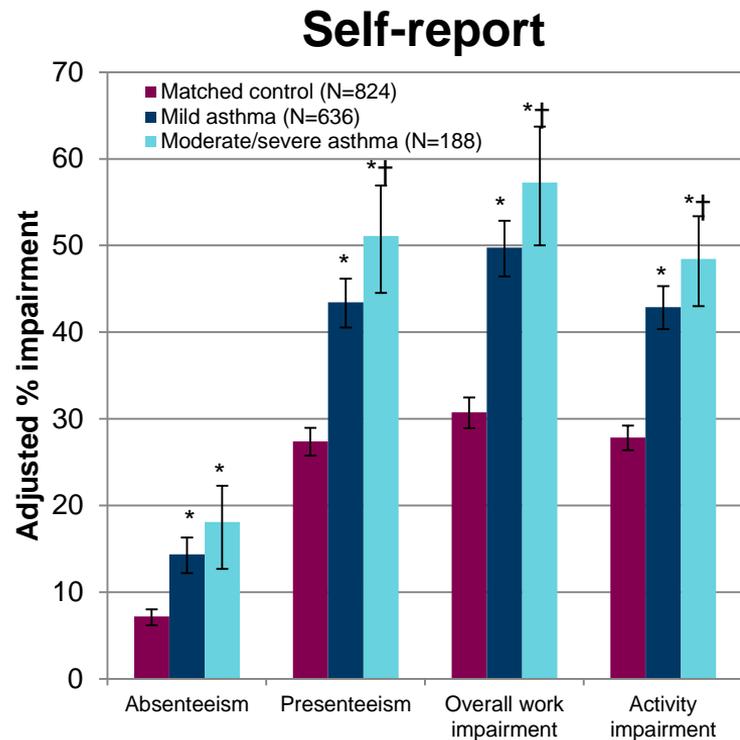
*p < .05 relative to matched controls; †p < .05 between mild and moderate/severe asthma

MCS = mental component summary; PCS = physical component summary score

All models controlled for sex, household income, body mass index, smoking habits, and the Charlson comorbidity index.



Mild and moderate/severe asthma had significantly more impairment than matched controls. No differences in impairment were observed between mild and moderate/severe asthma defined by GINA2014 guidelines.

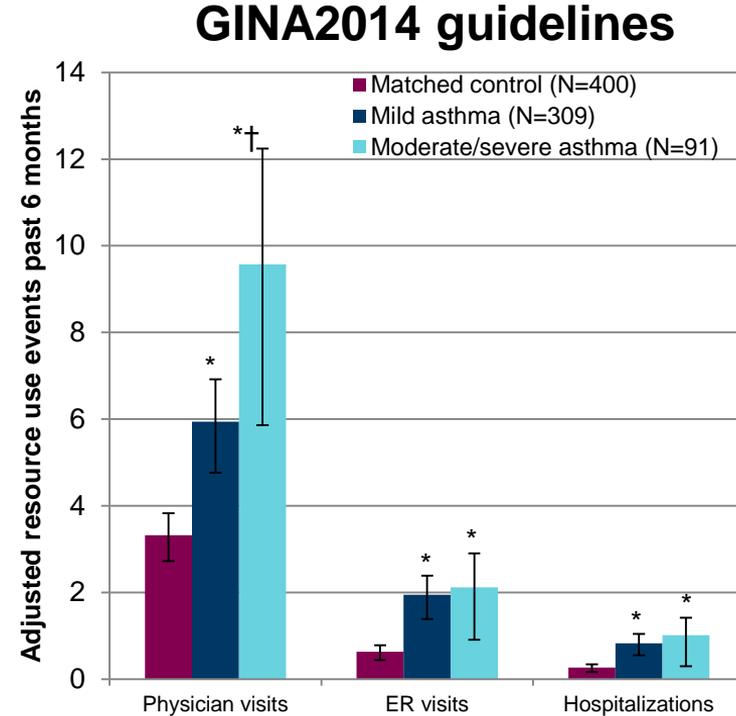
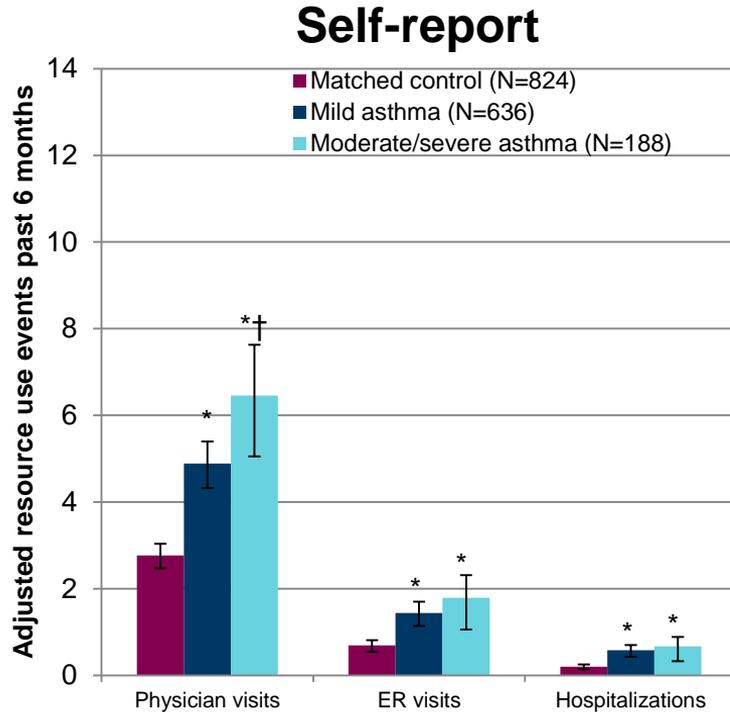


* $p < .05$ relative to matched controls; † $p < .05$ between mild and moderate/severe asthma

10 All models controlled for sex, household income, body mass index, smoking habits, and the Charlson comorbidity index.



Mild and moderate/severe asthma had significantly more HCRU than matched controls. No differences in ER visits and hospitalizations were observed between mild and moderate/severe asthma regardless of definition.



* $p < .05$ relative to matched controls; † $p < .05$ between mild and moderate/severe asthma

11 All models controlled for sex, household income, body mass index, smoking habits, and the Charlson comorbidity index.



Limitations

- All data were self-reported
 - No verification of diagnosis or treatment history
- Potential for misclassification of severity
 - Only patients with treatment data could be classified using GINA2014 guidelines
 - “Mild” patients in GINA2014 guidelines may represent combination of “mild” and undertreated “moderate” patients
- NWHS primarily (but not exclusively) relied upon respondents with Internet access and these patients could be different from the broader population
- China NHWS was focused on an urban population and the results may not generalize to more rural areas.



Conclusions

- Prevalence of asthma was estimated at **2%**
- Using both the GINA2014 guidelines and self-report definitions, most patients with asthma in urban China are mild (~75%)
- A significant burden was observed with respect to QOL, work productivity, activity impairment, and healthcare resource use
 - When defining severity based on GINA2014 guidelines, few differences were observed between “mild” and “moderate”/”severe” patients
- Better asthma management may provide benefits to both the patients and society



GINA2014 Guidelines



Mild

- Short-acting beta-agonists (SABA):
salbutamol, levosalbutamol, terbutaline, pirbuterol,
procaterol, clenbuterol, metaproterenol, fenoterol, bitolterol
mesylate, ritodrine, isoprenaline
- Inhaled corticosteroids (ICS) (Step 2)
only: beclomethasone, budesonide, ciclesonide, flunisolide,
fluticasone, mometasone, triamcinolone
- Leukotriene receptor antagonist
(LTRAs) (Step 2) only: montelukast,
pranlukast, zafirlukast, zileuton
- Theophylline (Step 2) only

Moderate/severe

- ICS (defined above) + long-acting
beta-agonist (LABA) (Step 3/4):
salmeterol, formoterol, salbutamol
- ICS (defined above) + LTRA (defined
above) (Step 3/4)
- ICS + theophylline (Step 3/4)
- Omalizumab (Step 5)

