

2nd Edition

GLOBAL ATLAS OF ASTHMA



www.eaaci.org

Published by the European Academy of Allergy and Clinical Immunology

April 2021

5

SOCIO-ECONOMIC COSTS OF ASTHMA

Job F.M. van Boven

University Medical Center Groningen
Groningen, The Netherlands

Mohsen Sadatsafavi

University of British Columbia
Vancouver, Canada

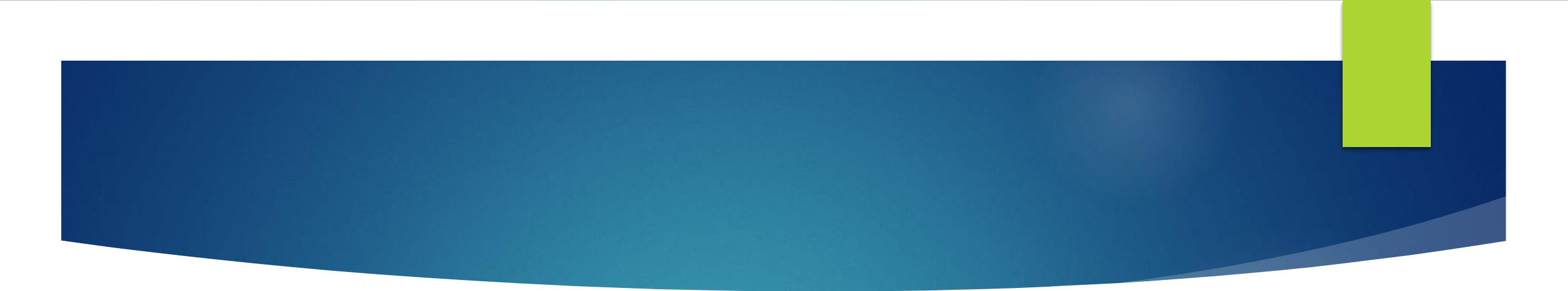
Slides by:

Babak Ghalehbaghi, M.D.
Allergist and Clinical Immunologist



سامانه جامع آسم ایران
www.ginasthma.ir



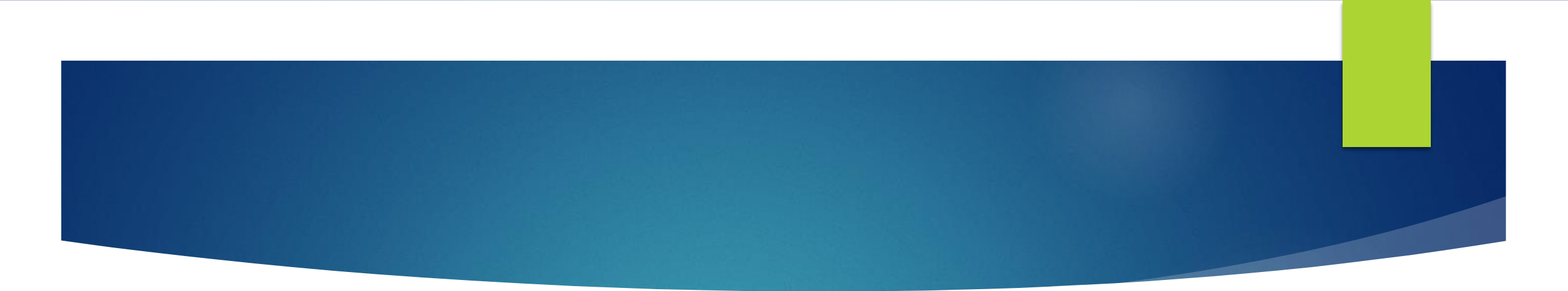
- 
- ▶ The **clinical impact of asthma** is accompanied by a **significant socio-economic burden** on patients, their families, and societies at large.
 - ▶ Notably, the **full economic burden** involves both direct costs, such as medication, outpatient visits, and hospital admissions, as well as indirect costs such as work productivity losses.
 - ▶ In this chapter, the economic impact of asthma, trends and cost drivers are described.

ECONOMIC BURDEN OF ASTHMA: A GLOBAL CHALLENGE

- ▶ The **economic burden of asthma** is dependent on the total number of people with asthma *multiplied* by the mean cost per patient.
- ▶ Multiple studies, mostly from high-income countries where detailed data are often available, have highlighted the **significant excess costs due to asthma**.
- ▶ Given the large international variability in the detection and diagnosis of asthma, the distribution of its severity, extent of treatment availability, and structure and process of care, **most data can however not be directly compared across countries**.
- ▶ Therefore, it can be **challenging to provide an estimate of the total global economic burden of asthma**, yet detailed analyses from individual countries provide useful insights into its cost components and drivers.

DIRECT AND INDIRECT COSTS

- ▶ The **costs of asthma** can generally be divided in direct costs and indirect costs.
- ▶ The **direct costs** of asthma involve costs related to healthcare utilization (e.g. medication, healthcare provider visits, and hospital admissions) to control or monitor asthma.
- ▶ **Indirect costs** include work productivity losses, missing school in the younger age groups and caregiver burden.
- ▶ **Within the work productivity related costs**, one can distinguish between absenteeism (missed workdays) and presenteeism (less productive while at work).

- 
- ▶ A detailed population-based study from the **United Kingdom** estimated the total annual national direct costs of asthma at around £1.1 billion.
 - ▶ Of these costs, 74% were attributed to medication and primary care services (60% prescribing, 14% consultations), 13% for disability claims, and 12% for hospital care.
 - ▶ **A smaller but more detailed Korean cost study** provided the *mean direct and indirect per patient cost of asthma by severity*, ranging from \$1361 and \$1421 for mild and moderate asthma respectively, to \$5141 for severe asthma (Figure 1).

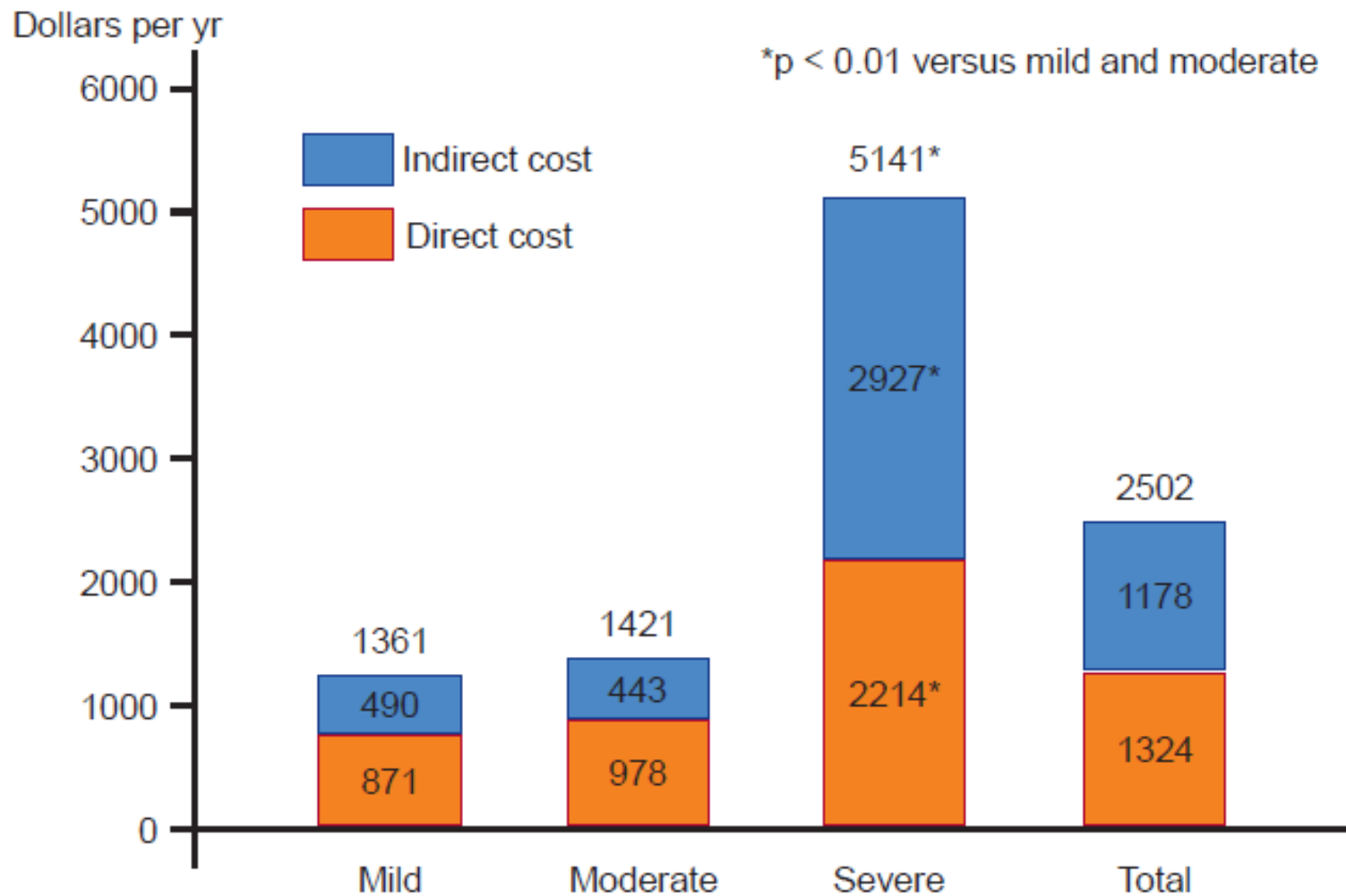
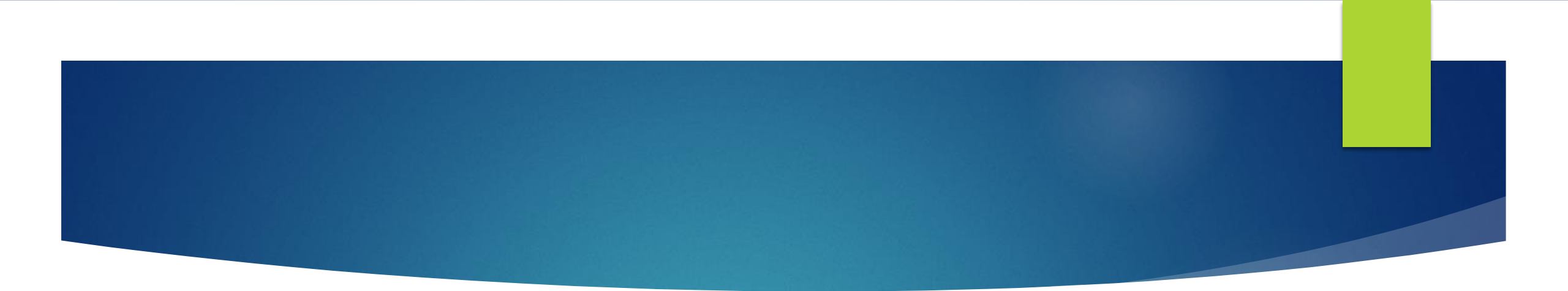


Figure 1 Asthma direct and indirect costs by severity.

(Reproduced from *Journal of Asthma*, Kim SH, et al., *Economic costs for adult asthmatics according to severity and control status in Korean tertiary hospitals*, 2012; 49(3):303-9 with the permission of Taylor & Francis Ltd.)

- 
- ▶ **Indirect costs** add substantially to the total asthma costs, particularly in people with *uncontrolled and severe asthma*.
 - ▶ Of note, in low- and middle-income countries, it has been demonstrated that **presenteeism due to asthma is generally more profound than absenteeism**, probably driven by the limited access to care and social security systems.

HIGH COST SUBPOPULATIONS

- ▶ While the majority of asthma cost studies provide an average number, there are several clearly **identified sub-populations where asthma costs are significantly higher than average**.
- ▶ In particular, these involve patients with **more severe forms of (uncontrolled) asthma** and **patients with comorbidities** (Figure 2).
- ▶ **Severe uncontrolled asthma** results in more healthcare resource utilization driven by high symptom burden and comorbidities.
- ▶ Another sub-population with higher costs is asthma patients with high burden of comorbidity.
- ▶ In patients with asthma, the **prevalence of comorbid conditions is generally higher than in the general population**.

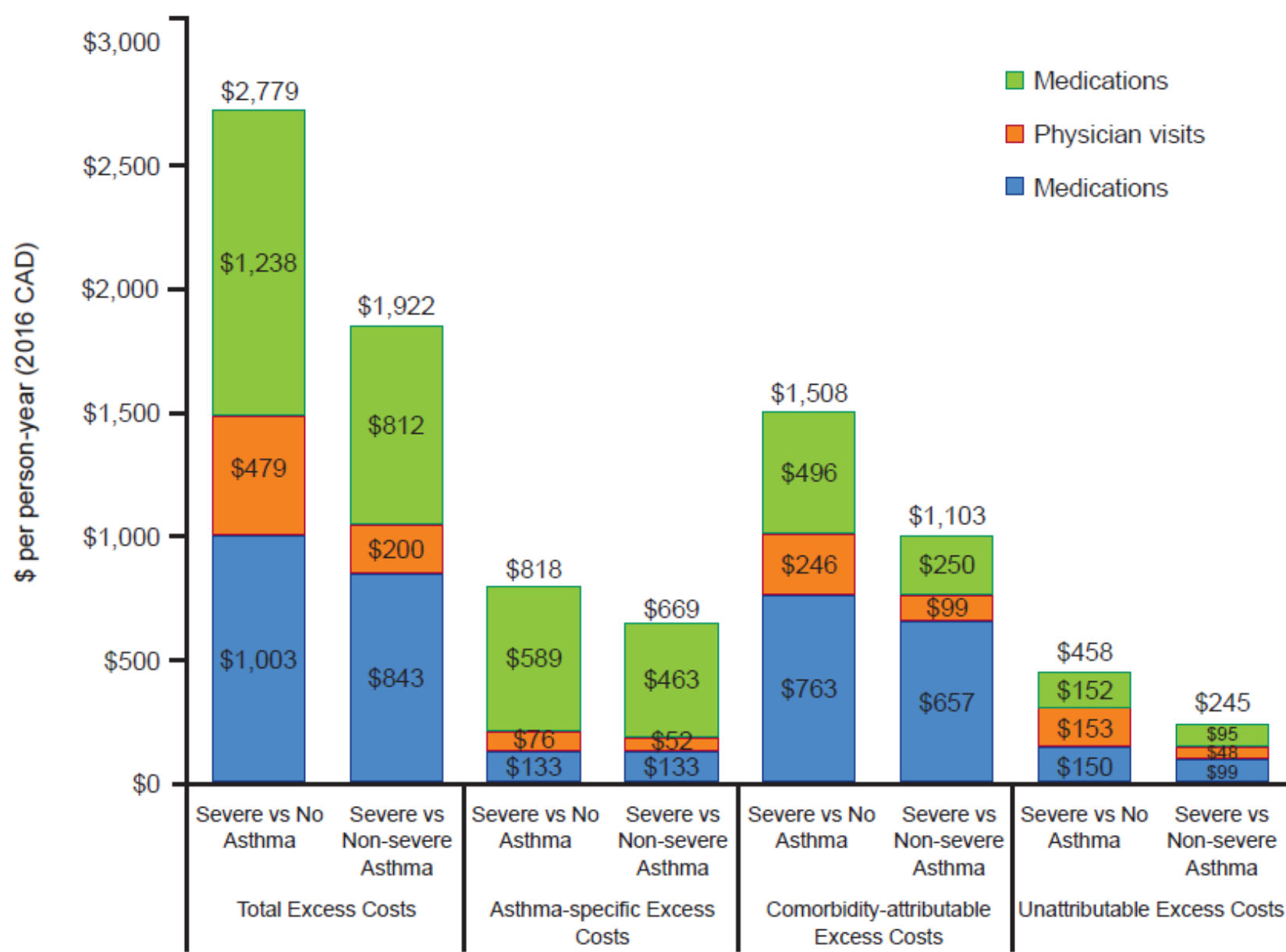
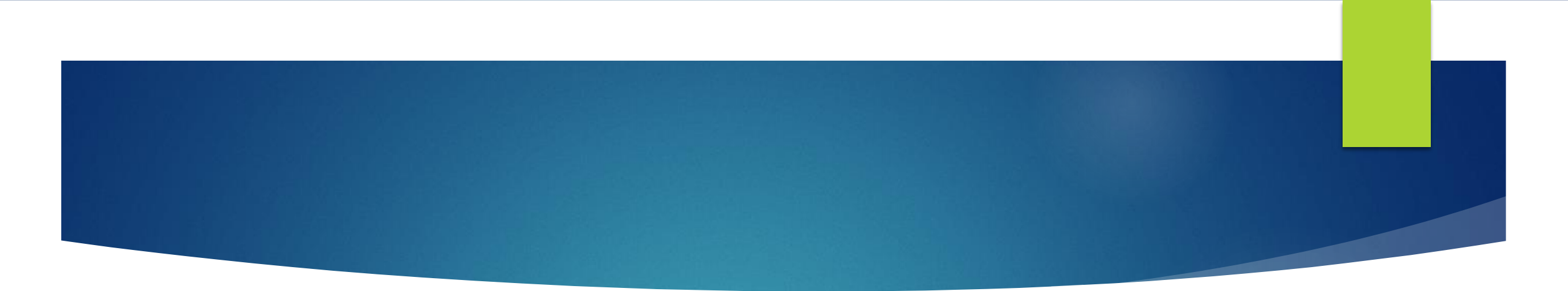


Figure 2 Excess costs of severe asthma versus no and non-severe asthma.

(Reproduced from *Economic burden of multimorbidity in patients with severe asthma: a 20-year population-based study*, Chen W, et al., 74, 1113-1119, 2019, with permission from BMJ Publishing Group Ltd.)

- 
- ▶ **Most costly comorbidities** involve other respiratory complaints (e.g. COPD), mental and nervous system disorders (e.g. depression) and digestive comorbidities (e.g. reflux) (Figure 3).
 - ▶ **Historically**, patients with severe asthma were often fully dependent on oral corticosteroids that can result in costly *long-term complications such as osteoporosis*.
 - ▶ **Currently**, *targeted biologic therapies* are available, yet these come at high costs (\$15,000- 20,000 per year) and are only available in high-resource settings.

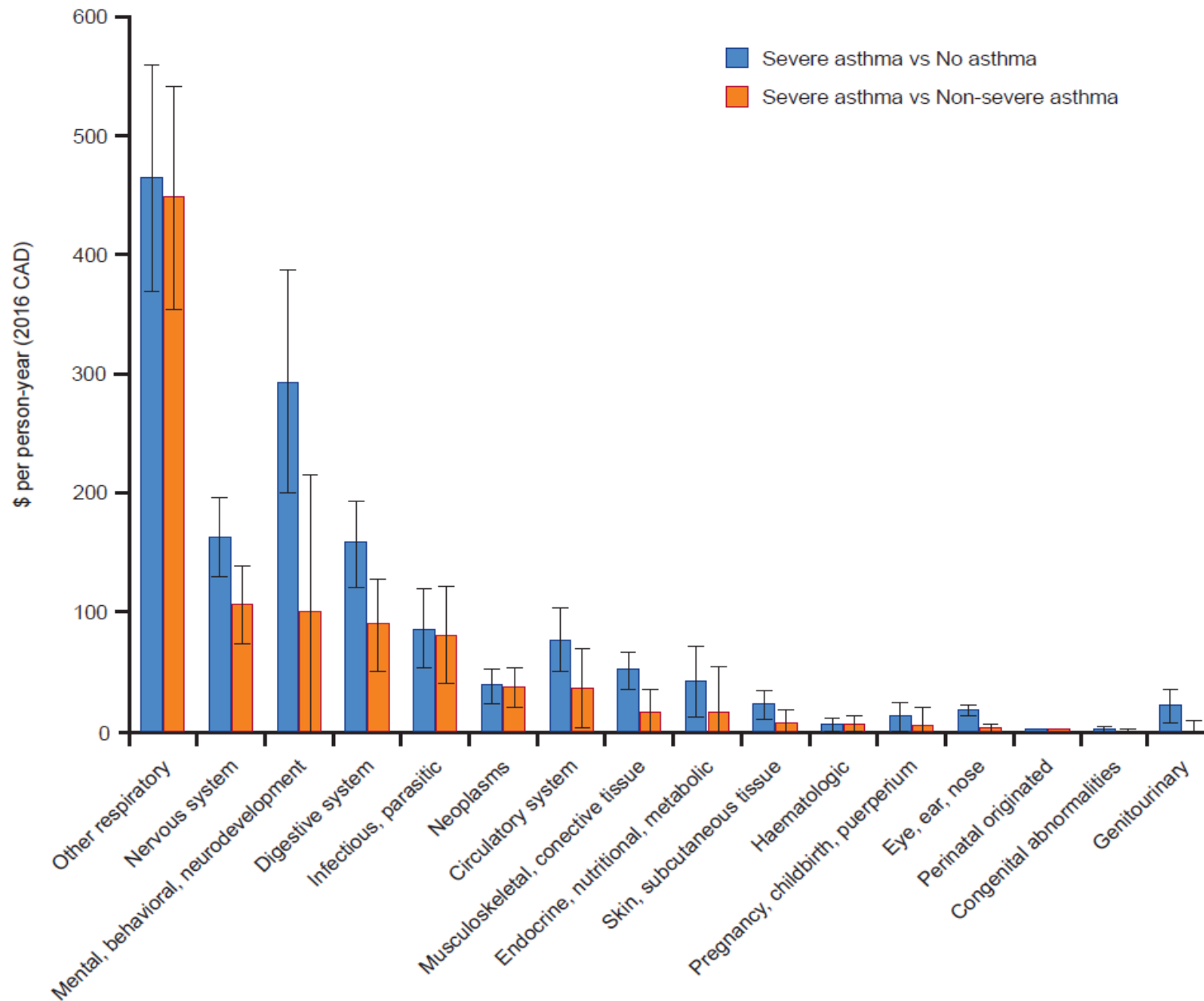


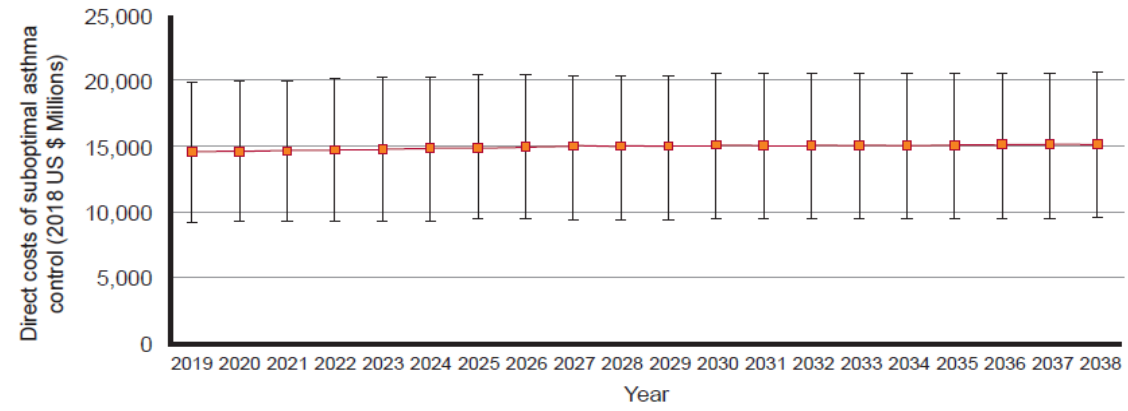
Figure 3 Excess costs of asthma due to comorbidities.

(Reproduced from *Economic burden of multimorbidity in patients with severe asthma: a 20-year population-based study*, Chen W, et al., 74, 1113-1119, 2019, with permission from BMJ Publishing Group Ltd.)

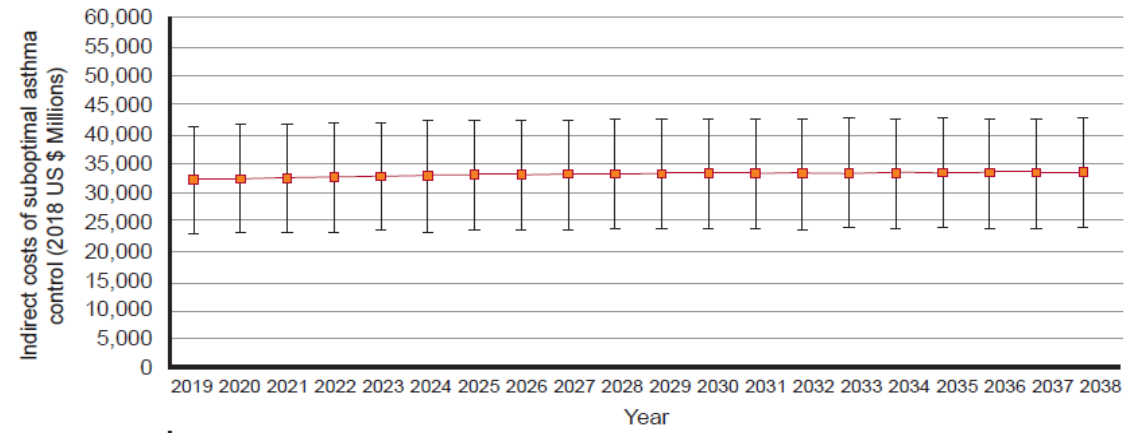
TRENDS IN COSTS

- ▶ **While no global estimate exists, models** have provided us with estimations of the 20-year projected direct costs of uncontrolled asthma in the United States (in 2018 USD values).
- ▶ **Annual costs** (around 15 billion) will slightly increase over the years and will cost the US a total of around \$300 billion (95%CI: 190- 411) over the next 20 years.
- ▶ **When also indirect costs are included**, the total 20-year costs are estimated at \$963 billion (95%CI: 664-1263).
- ▶ **In addition to these costs**, an estimated 15.46 million (95%CI: 12.77- 18.14) quality adjusted life years (QALYs) will be lost (Figure 4).

A



B



C

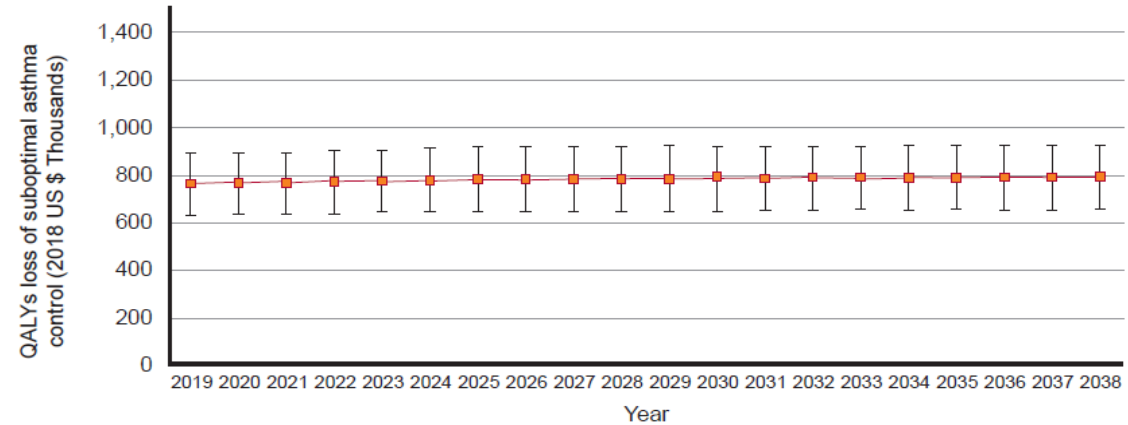


Figure 4 20-year trends in costs and QALYs of asthma in the USA.

(Reproduced from the Projected Economic and Health Burden of Uncontrolled Asthma in the United States, Yaghoubi M, et al. *Am J Respir Crit Care Med.* 2019; 200(9):1102-1112, under the terms of the creative commons attribution non-commercial license 4.0)

KEY MESSAGES

- The economic burden of asthma, consisting of direct and indirect costs, is substantial
- Major direct costs include medication, outpatient visits, and hospital admissions
- Major indirect costs include work productivity losses, missing school, and caregiver burden
- Cost enhancing factors include severe, uncontrolled asthma, and comorbidities
- There are large global differences in the socioeconomic burden of asthma