Global Burden of Tobacco Use

Cathy Hoelzer, MPH, PA

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Objectives

- Describe the magnitude of tobacco use globally
- Discuss the disease burden attributed to smoking as reported in the GBD study
- Compare how smoking affects men, women, and teens differently.
- Briefly discuss the effects of second and thirdhand smoke exposure
- Understand barriers patients have in quitting smoking and clinicians have in helping them
- List practical ways we can help our patients in LMICs

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Magnitude of Tobacco Use

- **WHO estimates the number of smokers** worldwide to be 1.3 billion.
- **More than 8 million people die each year** from tobacco-related diseases.
- **Nearly 1.2 million deaths** are caused by exposure to secondhand smoke.
- **Approximately 40 million children aged 13–15** currently use tobacco products worldwide.
- **Over 80% of tobacco users** live in LMICs.

Source: WHO Tobacco Key Facts, May 24, 2022, https://www.who.int/news-room/fact-sheets/detail/tobacco



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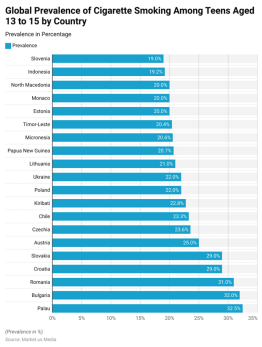
Countries with the Highest % of Smokers

Rank	Country	Smoking Prevalence (%)	Region
1	Nauru	~46.7%	Pacific Islands / Oceania
2	Myanmar	~42.3%	Southeast Asia
3	Serbia	~39.0%	Eastern Europe / Balkans
4	Bulgaria	~38.8%	Eastern Europe / Balkans
5	Indonesia	~38.7%	Southeast Asia
6	Papua New Guinea	~38.1%	Pacific Islands / Oceania
7	Croatia	~37.6%	Eastern Europe / Balkans
8	Timor-Leste	~37.2%	Southeast Asia
9	Kiribati	~36.8%	Pacific Islands / Oceania
10	Andorra	~36.4%	Western Europe

Note: China remains the world's largest consumer of cigarettes by pure volume due to its massive population size.

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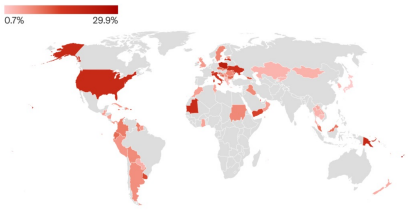
Teen Smokers aged 13-15



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Youth e-cigarette prevalence

Last 30-day e-cigarette use by youth, most recent year

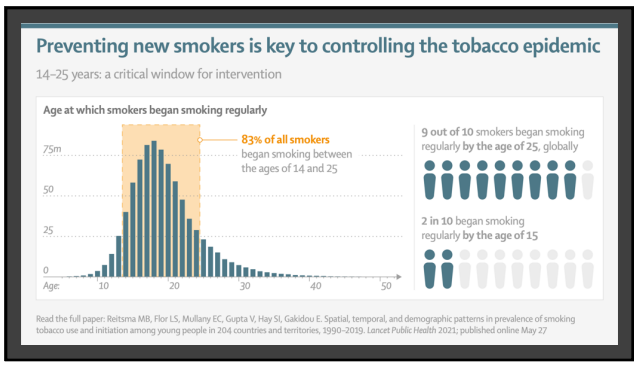


Surveillance of youth e-cigarette use needs to improve in most countries but current range is 0.7-29.9%.

Source: Various

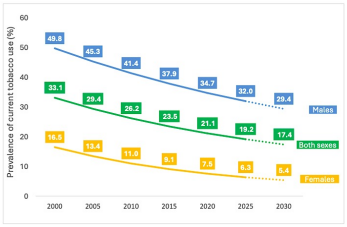
THE TOBACCO ATLAS

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Global Tobacco Use Expected to Decline



Source: WHO global report on trends in prevalence of tobacco use 2000-2024 and projections 2025-2030. Geneva: World Health Organization; 2025.

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Does smoking affect genders and teens differently?

YES!

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Male Smokers and Sexual Health

Smoking Harms Male Fertility:

- Toxic chemicals damage sperm — nicotine, carbon monoxide, cadmium & other toxins
- Lower sperm count & motility
- Damages sperm DNA/chromatin
- Reduces sperm viability & semen quality
- Increases oxidative stress & sperm cell death

Tesarik, Jan. 2025. "Lifestyle and Environmental Factors Affecting Male Fertility, Individual Predisposition, Prevention, and Intervention" *International Journal of Molecular Sciences* 26, no. 6: 2797. https://doi.org/10.3390/ijms26062797

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Women and Smoking—A Gender Perspective

- **Gender-Specific Risks:** Premature menopause, infertility, pregnancy & neonatal complications
- **Higher Disease Risk:** Increased cervical cancer, COPD, & 25% higher CAD risk than men
- **Nicotine & Addiction:** Faster metabolism leads to higher addiction rates
- **Challenges in Quitting:** Lower risk awareness, fear of weight gain, lower success rates
- **Secondhand Smoke:** 47% of SHS-related deaths occur in women

Source: https://www.escardio.org/communities/council/cardiology-practice/scientific-documents-and-publications/journal/volume-20/women-and-tobacco-a-gender-perspective-1
Accessed 8/19/2026.

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Nicotine and Mental Health Among Adolescents

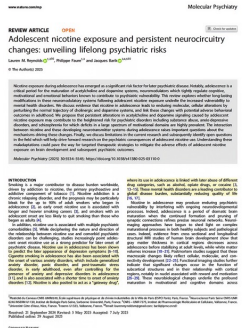
Adolescent nicotine use is linked to later mental health problems.

Associated with increased risk of **depression** and **anxiety disorders**. (Generalized anxiety, panic d/o, PTSD)

Earlier smoking initiation is associated with an earlier onset of anxiety and depression.

Nicotine use during adolescence may act as a **"gateway" to later substance use**, including alcohol, opioids, and cocaine.

Mental health disorders can significantly **reduce quality of life** and contribute substantially to the global disease burden.



Molecular Psychiatry

REVIEW ARTICLE OPEN

Adolescent nicotine exposure and persistent neurocircuitry changes: unveiling lifelong psychiatric risks

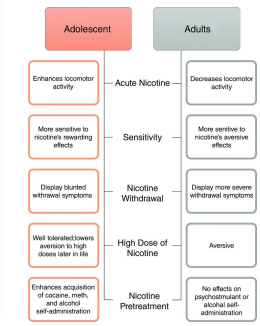
Lauren M. Reynolds, Philippe Faure and Jacques Barik

© The Author(s) 2025

Molecular Psychiatry (2025) 30:5934–5946; https://doi.org/10.1038/s41380-025-03110-0

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Nicotine and the Adolescent Brain



SourceYuan M, Cross SJ, Loughlin SE, Leslie FM. Nicotine and the adolescent brain. J Physiol. 2015 Aug 15;593(16):3397-412. doi: 10.1113/JP270492. Epub 2015 Jun 23. PMID: 26018031; PMCID: PMC4560573.

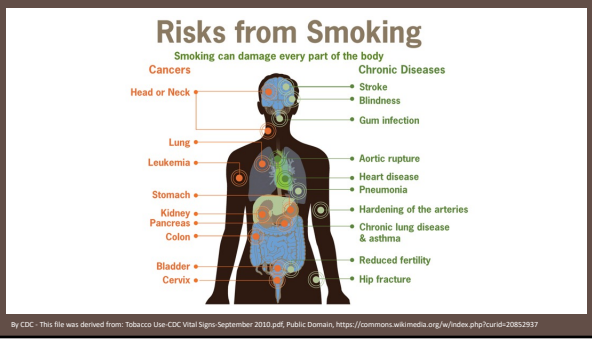
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Disease burden related to smoking

- Tobacco use is the #1 cause of preventable deaths worldwide and kills up to half of its users
- Smokers die an average of 10 years earlier than non-smokers
- One in six NCD-related deaths are attributed to smoking tobacco use
- Largest number of deaths in 2019 attributable to
  - Ischemic heart disease (1·68 million)
  - COPD (1·59 million)
  - Tracheal, bronchial, and lung cancer (1·31 million)
  - Stroke (0·931 million)

Source: Reitsma M, Kendrick P, Ababneh E et al., **Spatial, temporal, and demographic patterns in prevalence smoking tobacco use and attributable disease burden in 204 countries and territories, 1990–2019: a systematic analysis from the Global Burden of Disease Study 2019,** The Lancet, 2021; 397, 2337-2360

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By CDC - This file was derived from: Tobacco Use-CDC Vital Signs-September 2010.pdf, Public Domain, https://commons.wikimedia.org/w/index.php?curid=20852937

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Types of smoke exposure

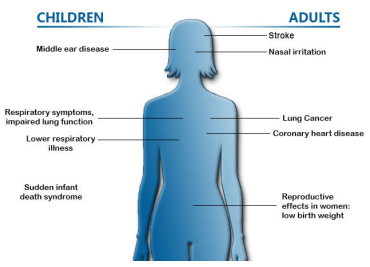
First-hand smoke or vapor – inhaled by the person who smokes or vapes

Second-hand smoke or vapor –the smoke that comes from the end of a burning cigarette

Third-hand smoke or vapor – the residue and gases left on clothes, cars, objects, or in a room after someone smokes or vapes

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Risks of Secondhand Smoke Exposure



SHS is more toxic than directly-inhaled firsthand smoke--Just 30 minutes of exposure to secondhand smoke can cause heart damage like that of an everyday smoker

Source: CDC

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Health Effects of Thirdhand Smoke Exposure

Table 4. Health effects of third-hand smoke exposure.

Chemical Substances	Site of Actions	Types of Health Effects	References
Nicotine	Adrenal glands	Elevation of blood pressure	[66]
Nitrosamine	Lung	Cause cancer	[67]
Formamide, isocyanic acid	Joints Eyes, heart	Rheumatoid arthritis Cataracts and cardiovascular diseases	[13,73,74]
Lead and cadmium	Heart, neuron	Cardiovascular disease, bad neurobehavior	[65,66]
Cotinine	Urine, saliva	Endocrine, immune system disorders	[68]
Third-hand smoke mixture	Skin	Weak wound healing ability	[66,70]
	Liver cells, lung	Fatty degeneration, inflammation	[70]
	Human HepG2 cells	DNA damage	[58]
	Male reproductive system	Change germ cell line, metabolic ability	[71]
NNA	Female reproductive system	Destroy follicles	[72]
NNN	Esophagus and nasal cavity of rats, lungs of mice, trachea and nasal cavity of syrian golden hamster	Induced tumor	[69]
NNK	Lung, nasal mucosa, liver	Lung adenoma, nasal mucosa cancer, liver cancer	[69]

Wang, Y.; Gu, J. The Physical Processes and Chemical Transformations of Third-Hand Smoke in Indoor Environments and Its Health Effects: A Review. *Atmosphere* **2025**, *16*, 370. https://doi.org/10.3390/atmos16040370; accessed 8/19/2026.

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Dangers of Hookah, Shisha, Nargile

- 1 hour of hookah can be equivalent to 100 to 200 cigarettes.
- Waterpipe smoking is associated with many oral diseases, including cancer.



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Tobacco Control Policies-Do they work?

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Barriers to Promoting Smoking Cessation in Developing Countries

- **Tobacco is a cash crop** in 80 developing countries
- **Low awareness** among policymakers and the public about health risks
- **Weak cessation policies & training** for healthcare providers (HCWs)
- **Poor healthcare infrastructure**: lack of quit lines, NRT, and cessation tools like 5As & 5Rs
- **Aggressive tobacco industry marketing**, especially in LMICs

Source: Abdullah ASM, Husten CG, Promotion of smoking cessation in developing countries: a framework for urgent public health interventions, *Thorax* 2004;**59**:623-630. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1747072/

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Clinician Barriers to Helping Pts. Quit

- Time constraints of practice
- Low expectation of success
- Lack of knowledge of what to do
- Frustration with smokers

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Tobacco Use Among Doctors

- **Smoking Prevalence in Physicians:** ~21%
- **Highest Rates:** Among family practitioners & medical students
- **Global Issue:** Common in both developed & developing countries
- **Regional Trends:** Highest in Europe & Asia; Lowest in Oceania (Australia & New Zealand)

Besson A, Tarpin A, Flaudias V, Brousse G, Laporte C, Benson A, Navel V, Bouillon-Minois JB, Dutheil F. Smoking Prevalence among Physicians: A Systematic Review and Meta-Analysis. Int J Environ Res Public Health. 2021 Dec 17;18(24):13328. doi: 10.3390/ijerph182413328. PMID: 34948936; PMCID: PMC8705497.

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Patient's Barriers to Quitting Smoking

- Peer Pressure
- Lack of knowledge of risks of smoking
- Fear of weight gain
- Not able to deal with stress any other way
- Socially acceptable habit
- Don't know how or where to access help
- Can't afford cessation products

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Our Role in Tobacco Cessation

Helping Patients Quit

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Know Your Patient's Dependence Level

Fagerstrom Test for Nicotine Dependence

Score 8+ = high dependence
Score 5-7 = moderate dependence
Score 3-4 = low to moderate dependence
Score 0-2 = low dependence

QUESTION	RESPONSE	SCORE
1. How soon after you wake up do you smoke your first cigarette?	After 60 minutes	0
	31-60 minutes	1
	6-30 minutes	2
	Within 5 minutes	3
2. Do you find it difficult to refrain from smoking in places where it is forbidden?	No	0
	Yes	1
3. Which cigarette would you hate most to give up?	The first in the morning	1
	Any other	0
4. How many cigarettes do you smoke per day?	10 or less	0
	11-20	1
	21-30	2
	31 or more	3
5. Do you smoke more frequently during the first hours after waking than during the rest of the day	No	0
	Yes	1
6. Do you smoke even if you are so ill that you are in bed most of the day?	No	0
	Yes	1
Total		

Adapted from Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom KO. The Fagerstrom Test for Nicotine Dependence: A revision of the Fagerstrom Tolerance Questionnaire. British Journal of Addictions 1991; 86:1119-27.

The most distinctive indicators of nicotine dependence are:
- Time to first cigarette after waking
- The number of cigarettes smoked per day

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Our Role as Healthcare Worker – The 5A's



5 A's of Tobacco Cessation, Developed through the **U.S. Public Health Service Clinical Practice Guideline,** ***Treating Tobacco Use and Dependence*** **(Fiore et al., 2000).**

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STAR Method-- Develop a Quit Plan

Help the patient:

- Set a quit date (within 2 weeks)
- Seek support from family & friends
- Prepare for challenges
- Remove tobacco & make home smoke-free

Source: WHO



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5 Rs of Motivation to Quit Smoking

Ask patient to identify:

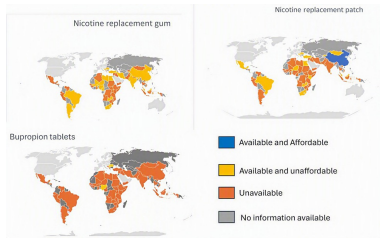
- **Relevance:** Personal reasons to quit
- **Risks:** Negative consequences of smoking
- **Rewards:** Benefits of quitting
- **Roadblocks:** Challenges to quitting
- **Repetition:** Reinforce at every visit; multiple attempts may be needed

Source: https://www.ahrq.gov/prevention/guidelines/tobacco/5rs.html



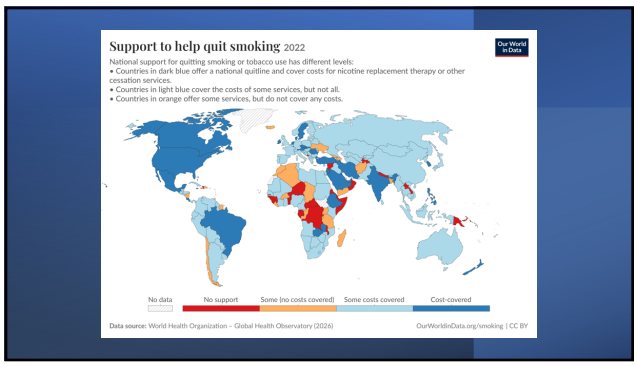
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NRT or Bupropion

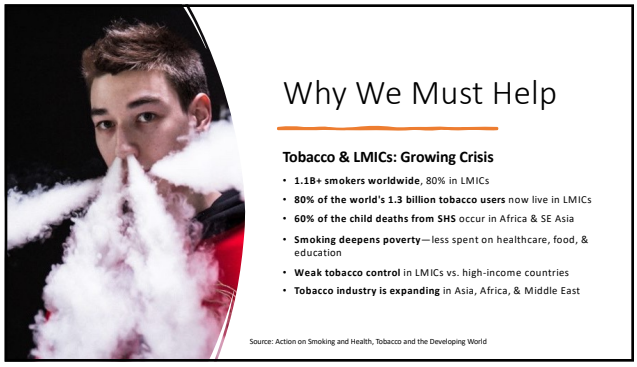


Source: Plum C, Stolbrink M, Ozoh O, Jayasooriya S, Nightingale R, Mortimer K, Halpin D. Availability, cost and affordability of essential medicines for smoking cessation in low-income and middle-income countries: a cross-sectional study. Thorax. 2025 Mar 18;80(4):248-250. doi: 10.1136/thorax-2024-222391. PMID: 39900489; PMCID: PMC12015041.

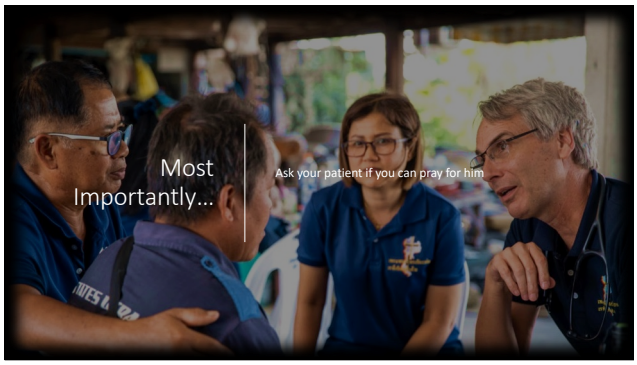
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Support to help quit smoking 2022
Our World in Data
National support for quitting smoking or tobacco use has different levels:
• Countries in dark blue offer a national quitline and cover costs for nicotine replacement therapy or other cessation services.
• Countries in light blue cover the costs of some services, but not all.
• Countries in orange offer some services, but do not cover any costs.
No data
No support
Some (no costs covered)
Some costs covered
Cost-covered
Data source: World Health Organization – Global Health Observatory (2026)
OurWorldinData.org/smoking | CC BY

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Why We Must Help
Tobacco & LMICs: Growing Crisis
• 1.1B+ smokers worldwide, 80% in LMICs
• 80% of the world's 1.3 billion tobacco users now live in LMICs
• 60% of the child deaths from SHS occur in Africa & SE Asia
• Smoking deepens poverty—less spent on healthcare, food, & education
• Weak tobacco control in LMICs vs. high-income countries
• Tobacco industry is expanding in Asia, Africa, & Middle East
Source: Action on Smoking and Health, Tobacco and the Developing World

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Most Importantly…
Ask your patient if you can pray for him

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Recommended Resources

- Toolkit for Delivering the 5A's and 5R's Brief Tobacco Interventions in Primary Care, WHO, 2014
- Pharmacological Approach to Smoking Cessation: An Updated Review for Daily Clinical Practice. Giulietti F, Filipponi A, Rosettani G, Giordano P, Iacoacci C, Spannella F, Sarzani R.
- Spatial, temporal, and demographic patterns in prevalence of smoking tobacco use and attributable disease burden in 204 countries and territories, 1990–2019: a systematic analysis from the Global Burden of Disease Study, GBD 2019 Tobacco Collaborators
- Pipe AL, Evans W, Papadakis, Smoking cessation: health system challenges and opportunities, Tobacco Control 2022;31:340-347

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