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RESPIRATORY CARE CHALLENGES AND OPPORTUNITIES IN UNDERSERVED COMMUNITIES

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LEARNING OBJECTIVES

1) Review anticipated future shortages of pulmonary physicians and implications for care in underserved communities
2) Discuss case finding as an approach to identifying patients with undiagnosed obstructive lung disease
3) Discuss novel care models to fill gaps in respiratory care in underserved communities

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DISCLOSURES

Speakers Bureau for AstraZeneca

- Benralizumab (Fasenra)
- Tezepelumab (Tezspire)
- Budesonide/glycopyrrolate/formoterol fumarate (Breztri)
- Budesonide/albuterol (AirSupra)

Speakers Bureau for Sanofi

- Dupixumab (Dupixent)

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- Born in Red Oak, IA
- Home – West Point, NE
- Primary Pulmonary office at Methodist Jenny Edmundson in Council Bluffs, IA
- Pulmonary Outreach Clinic in Montgomery County Memorial Hospital

DISCLOSURES

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RURAL ACCESS TO HEALTHCARE

- Access to healthcare services is critical to good health, yet rural residents face a variety of access barriers
- "Access to Healthcare" – variety of definitions
  - *"The provision of the right service, at the right time, in the right place"*

(Rogers, Flowers, and Pencheon 1999)

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ACCESS TO HEALTHCARE

Access to healthcare is important for:

- Overall physical, social, and mental health status
- Disease prevention
- Detection, diagnosis, and treatment of illness
- Quality of life
- Avoiding preventable deaths
- Life expectancy

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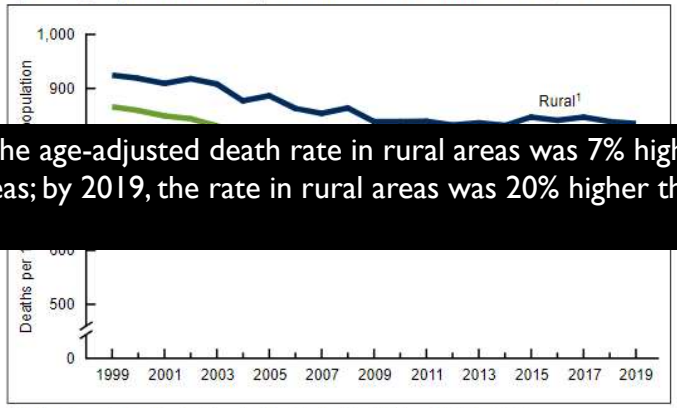
LIFE EXPECTANCY – RURAL VS. URBAN

Figure 1. Age-adjusted death rates, by urban-rural classification: United States, 1999–2019



- In 1999, the age-adjusted death rate in rural areas was 7% higher than in urban areas; by 2019, the rate in rural areas was 20% higher than in urban areas

[1]Significant decreasing trend from 1999 through 2010; stable trend from 2010 through 2019 ($p < 0.05$).
[2]Significant decreasing trend from 1999 through 2019, with different rates of change over time ($p < 0.05$).
NOTES: Urbanicity of county of residence is based on the 2013 NCHS Urban-Rural Classification Scheme for Counties; see Data source and methods. Access data table for Figure 1 at: https://www.cdc.gov/nchs/data/databriefs/db417-tables.pdf#1.
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

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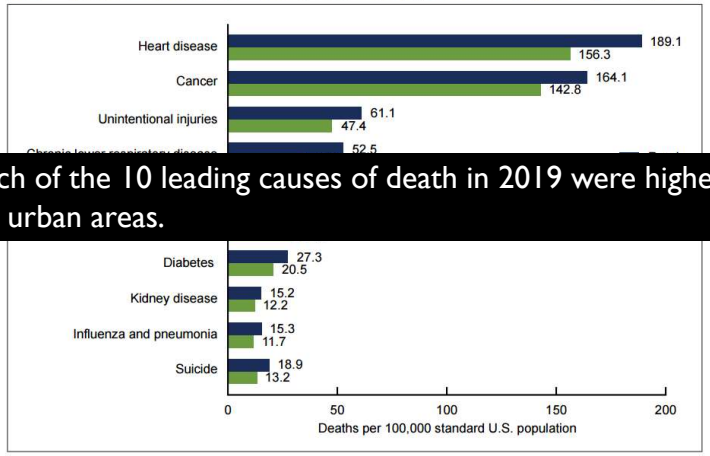
TOP 10 CAUSES OF DEATH – RURAL VS. URBAN

Figure 3. Age-adjusted death rates for the 10 leading causes of death, by urban-rural classification: United States, 2019



- Rates for each of the 10 leading causes of death in 2019 were higher in rural than in urban areas.

NOTES: Urbanicity of county of residence is based on the 2013 NCHS Urban-Rural Classification Scheme for Counties; see Data source and methods. Causes of death are ranked according to the number of deaths for the total population. Rates for all causes in rural areas were significantly higher than rates in urban areas ($p < 0.05$). Access data table for Figure 3 at: https://www.cdc.gov/nchs/data/databriefs/db417-tables.pdf#3.
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

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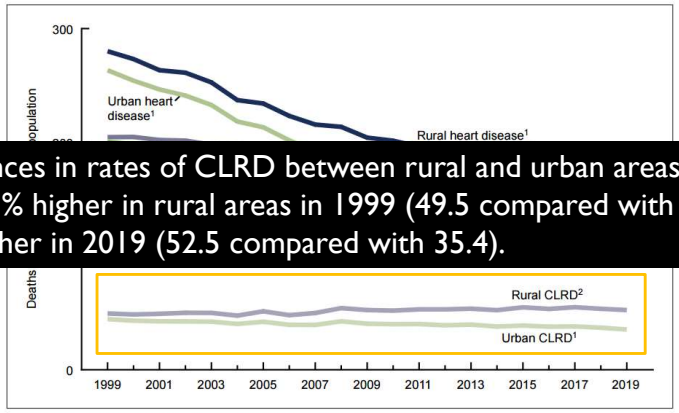
CHRONIC LOWER RESPIRATORY DISEASE

Figure 4. Age-adjusted death rates for heart disease, cancer, and chronic lower respiratory disease, by urban-rural classification: United States, 1999–2019



- Differences in rates of CLRD between rural and urban areas increased from 11% higher in rural areas in 1999 (49.5 compared with 44.5) to 48% higher in 2019 (52.5 compared with 35.4).

[1]Significant decreasing trend from 1999 through 2019, with different rates of change over time ($p < 0.05$).
[2]Stable trend from 1999 through 2019 ($p < 0.05$).
NOTES: Urbanicity of county of residence is based on the 2013 NCHS Urban-Rural Classification Scheme for Counties; see Data source and methods. CLRD is chronic lower respiratory disease. Access data table for Figure 4 at: https://www.cdc.gov/nchs/data/databriefs/db417-tables.pdf#4.
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

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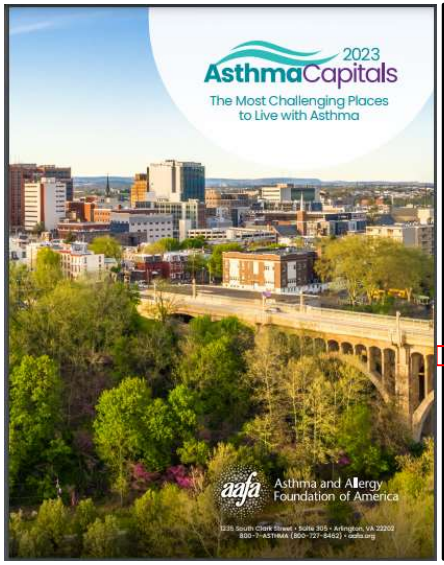
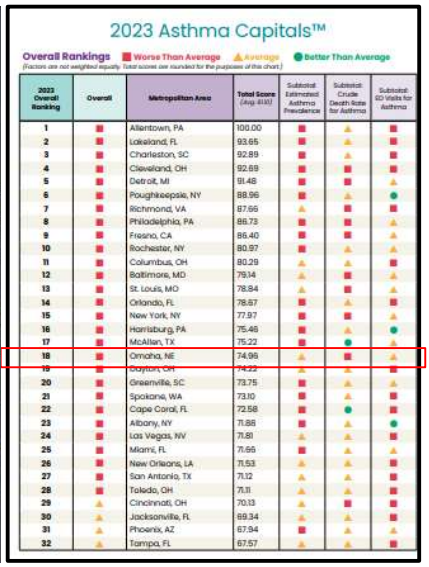
2023 AAFA REPORT





2023 Asthma Capitals™

Overall Rankings ■ Worse Than Average ▲ Average ● Better Than Average

(Factors are not weighted equally. Total scores are rounded for the purposes of this chart.)

2023 Overall Ranking	Overall	Metropolitan Area	Total Score (Avg. 81.82)	Subtotal: Estimated Asthma Prevalence	Subtotal: Crude Death Rate for Asthma	Subtotal: ED Visits for Asthma
1	■	Allentown, PA	100.00	■	▲	■
2	■	Lakeland, FL	93.65	■	▲	■
3	■	Charleston, SC	92.89	■	▲	■
4	■	Cleveland, OH	92.69	■	■	■
5	■	Detroit, MI	91.48	■	■	▲
6	■	Poughkeepsie, NY	88.96	■	▲	●
7	■	Richmond, VA	87.66	▲	■	■
8	■	Philadelphia, PA	86.73	■	■	▲
9	■	Fresno, CA	86.40	■	■	▲
10	■	Rochester, NY	80.97	■	▲	▲
11	■	Columbus, OH	80.29	▲	▲	■
12	■	Baltimore, MD	79.14	▲	■	▲
13	■	St. Louis, MO	78.84	▲	■	▲
14	■	Orlando, FL	78.67	■	▲	■
15	■	New York, NY	77.97	■	■	▲
16	■	Harrisburg, PA	75.46	■	▲	●
17	■	McAllen, TX	75.22	■	●	▲
18	■	Omaha, NE	74.98	▲	■	▲
19	■	Dayton, OH	74.22	▲	▲	■
20	■	Greenville, SC	73.75	■	▲	▲
21	■	Spokane, WA	73.10	■	▲	■
22	■	Cape Coral, FL	72.58	■	●	■
23	■	Albany, NY	71.88	■	▲	●
24	■	Las Vegas, NV	71.81	▲	▲	■
25	■	Miami, FL	71.66	■	▲	▲
26	■	New Orleans, LA	71.53	▲	▲	■
27	■	San Antonio, TX	71.12	▲	▲	■
28	■	Toledo, OH	71.11	▲	▲	■
29	▲	Cincinnati, OH	70.13	▲	■	■
30	▲	Jacksonville, FL	69.34	▲	▲	■
31	▲	Phoenix, AZ	67.94	■	▲	▲
32	▲	Tampa, FL	67.57	▲	▲	■

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The cities with the most asthma-related deaths† are:

Asthma-Related Deaths Ranking	Metropolitan Area	Overall Asthma Capital National Ranking
1	St. Louis, MO	13
2	Richmond, VA	7
3	Baltimore, MD	12
4	Chattanooga, TN	52
5	New York, NY	15
6	Fresno, CA	9
7	Memphis, TN	55
8	Omaha, NE	18
9	Jackson, MS	63
10	Philadelphia, PA	8

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2024 AAFA REPORT

Overall Rankings ■ Worse Than Average ▲ Average ● Better Than Average

(Factors are not weighted equally. Total scores are rounded for the purposes of this chart.)

2024 Overall Ranking	Overall	Metropolitan Area	Total Score (Avg. 56.08)	Subtotal: Estimated Asthma Prevalence	Subtotal: Crude Death Rate for Asthma	Subtotal: ED Visits for Asthma
33	▲	Orlando, FL	61.55	■	●	▲
34	▲	Omaha, NE	61.34	▲	■	▲
35	▲	Stockton, CA	61.27	▲	▲	■
36	▲	Hartford, CT	61.15	■	■	●
37	▲	Cincinnati, OH	60.07	▲	▲	▲
38	▲	Las Vegas, NV	59.20	▲	▲	▲
39	▲	Dayton, OH	58.85	▲	▲	■
40	▲	Louisville, KY	58.28	▲	●	■
41	▲	Toledo, OH	57.52	▲	▲	▲
42	▲	Jacksonville, FL	57.13	●	▲	■
43	▲	Atlanta, GA	57.09	▲	▲	▲
44	▲	Greensboro, NC	56.76	●	▲	■
45	▲	Pittsburgh, PA	56.57	▲	▲	▲
46	▲	Chattanooga, TN	56.40	●	■	▲
47	▲	Minneapolis, MN	56.10	▲	▲	●
48	▲	Jackson, MS	55.79	▲	■	▲
49	▲	Los Angeles, CA	55.53	▲	▲	▲
50	▲	San Diego, CA	55.12	▲	●	▲
51	▲	Daytona Beach, FL	54.54	▲	▲	▲
52	▲	Akron, OH	54.31	●	▲	■
53	▲	Chicago, IL	54.25	▲	■	▲
54	▲	Albuquerque, NM	54.13	▲	▲	▲

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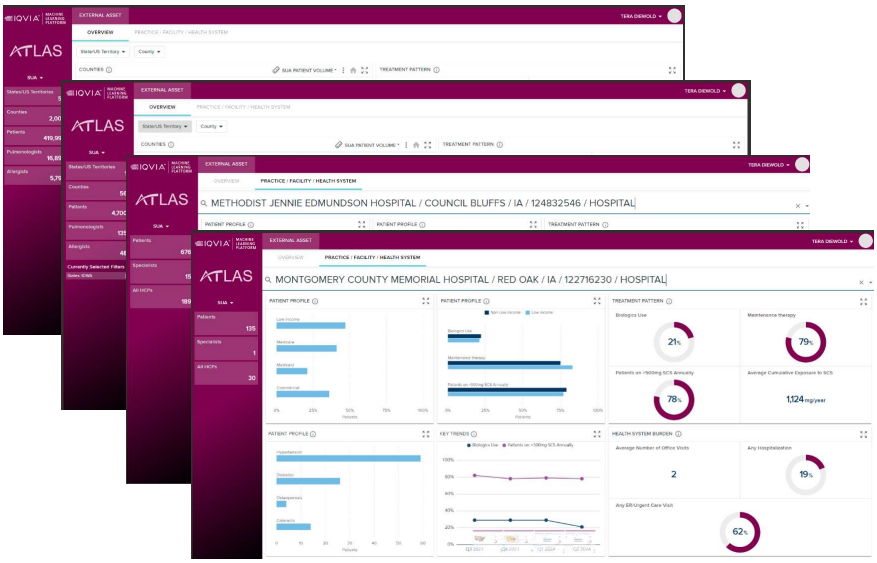
ATLAS SUA data



Despite similar biologic and maintenance therapy, Higher prednisone use and health system burden

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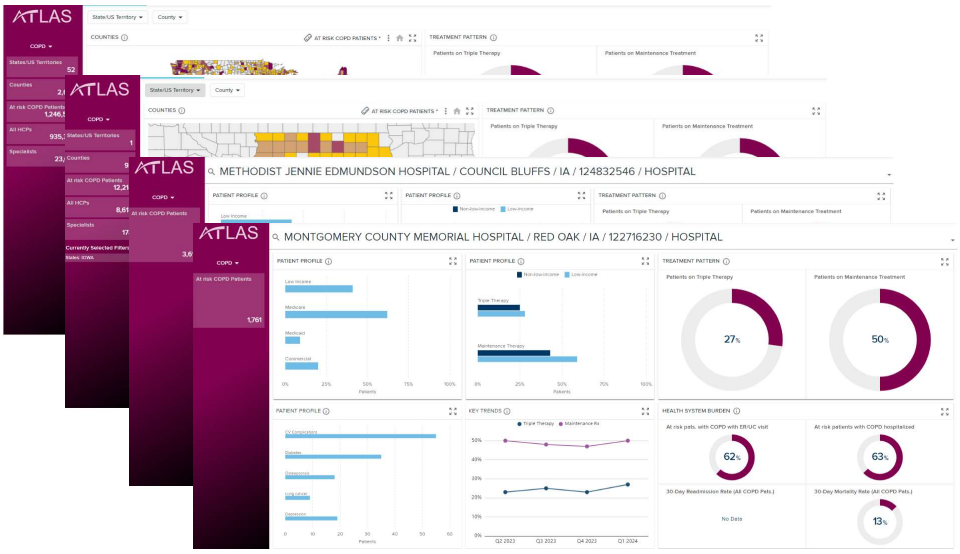
ATLAS COPD data



Despite similar triple and maintenance therapy, Higher health system burden and 30-day mortality

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ACCESS BARRIERS

Figure 1 – Overview of Rural Hospital Closures 2010-2021

YEAR	FULL CLOSURES	CONVERTED CLOSURES	TOTAL CLOSURES
2010	1	2	3
2011	2	3	5
2012	5	4	9
2013	5	8	13
2014	8	8	16
2015	11	6	17
2016	5	5	10
2017	8	2	10
2018	9	5	14
2019	9	9	18
2020	10	9	19
2021	0	2	2
Total	**73**	**63**	**136**

Source: The Cecil G. Sheps Center for Health Services at the University of North Carolina at Chapel Hill

American Hospital Association, September 2022

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ACCESS BARRIERS

Even when an adequate supply of healthcare services exists in the community, there are other factors that may impede healthcare access. Rural residents must also have:

- **Financial means** to pay for services, such as health or dental insurance that is accepted by the provider
- Means to reach and use services, such as **transportation** to services that may be located at a distance, and the ability to take **time off work** to use such services
- Confidence in their ability to **communicate** with healthcare providers, particularly if the patient (or provider) is not fluent in English or has limited health literacy
- **Trust** that they can use services without compromising privacy
- **Confidence** that they will receive quality care

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ACCESS BARRIERS

- The supply of primary care providers per capita is lower in rural areas compared to urban areas
- Travel to reach a primary care provider may be costly and burdensome for patients living in remote rural areas, with subspecialty care often even farther away
- These patients may substitute local primary care providers for subspecialists or they may decide to postpone or forego care

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BARRIERS TO ACCESS

Table 4. Barriers to Access

Barriers	Definition and Examples
Structural	The number, type, concentration, location, and organizational configuration of providers (often predicated by the health care financing system) • Health care plan or provider refuses care • Inadequate supply of providers • Prolonged waiting times
Financial	The cost of care to individuals and families, including the presence and type of health insurance coverage (includes consideration of the underinsured) • Uninsured cannot afford care • Underinsured cannot afford co-pay or deductible • Absent coverage for certain conditions
Personal and Cultural	A set of either explicit or implicit rules that determine the behavior of social subjects in relation to their health (IOM 1993) • Unable to travel to care • Unable to communicate with providers • Disrespectful provider behavior

Access to Rural Health Care – A Literature Review and New Synthesis. MacKinney *et al.* 2014.

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HEALTH PROFESSIONAL SHORTAGE AREAS – DIFFERENT POPULATIONS

Table 1. Comparison of Populations Residing in a HPSA and Not Residing in a HPSA

Population Characteristics	Residing in a HPSA	Not Residing in a HPSA
Percentage uninsured	23.9%	17.3%
Percentage with private insurance	47.2%	65.2%
Percentage with public insurance	28.9%	17.5%
Percentage in fair/poor health	17.7%	13.3%
Percentage ill with any chronic condition	32.6%	29.3%

Source: Hoffman, C., Damico, A., and Garfield, R. 2011. *Research Brief: Insurance Coverage and Access to Care in Primary Care Shortage Areas.* Washington, DC: Henry J. Kaiser Family Foundation.

"Compared to people not residing in a HPSA, those residing in a HPSA are more likely to be uninsured, less likely to have private insurance, more likely to have Medicaid or other public insurance, more likely to be in fair or poor health, and more likely to be ill with any chronic condition"

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THERE ARE SIGNIFICANT OPPORTUNITIES TO IMPROVE ACCESS TO SUBSPECIALTY CARE IN RURAL UNDERSERVED COMMUNITIES, ESPECIALLY IN PULMONARY MEDICINE

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RURAL OUTREACH RESPIRATORY CARE OPPORTUNITIES

- **Pulmonologist**
- **APP**
- **Pulmonologist *AND* APPs**
- **Telemedicine**

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PHYSICIAN SHORTAGE

Projected supply of and demand for physicians, 2025, 2030, and 2035

Projection Estimates	2025	2030	2035
Supply	909,720	940,690	982,640
Demand	966,970	1,019,770	1,063,820
Surplus / (Shortage)	(57,259)	(79,080)	(81,180)
Percent Adequacy	94%	92%	92%

Notes: Demand and supply estimates and projections are in full-time equivalents (FTEs), defined as working 40 hours a week. Adequacy is calculated by taking projected supply in 2035 divided by projected demand in 2035. FTE estimates may differ from estimates of the headcounts of the health workforce.

National Center for Health Workforce Analysis, November 2022

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IMPORTANT DIALOGUE

- "The adequacy of all physicians in the U.S. in 2035 is smaller in nonmetro areas than metro areas. This means nonmetro areas will experience greater shortages of various types of physicians than metro areas. The percent adequacy of supply across all physician specialties is projected to 48% in nonmetro areas **(a shortage of nearly 52%)**, compared to 99% in metro areas (a shortage of just 1%) in 2035."
- "It is important to note that shortages in some specialties may, in part, be mitigated by increased use of nurse practitioners and physician assistants to perform certain services. Scope-of-practice for NPs and PAs has increased in recent years, and these professions are projected to have excess supplies by 2035."

National Center for Health Workforce Analysis, November 2022

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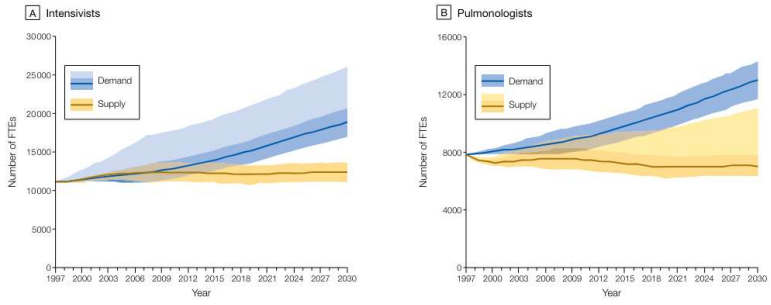
PROJECTED PULMONOLOGIST SHORTAGE

Figure. Forecast of Supply and Demand for Intensivists and Pulmonologists Through 2030



FTE indicates full-time equivalent. The lines represent the base model while the margins of the shaded areas represent the widest upper and lower bounds of the sensitivity analysis. A, the darker demand bounds are generated by varying the disease-specific intensive care unit (ICU) use ±10% and the supply bounds are generated by varying the number of hours worked by specialists ±10%. The lighter upper demand bound represents an increase in the use of intensivists to 66% of all ICU patients. B, the demand bounds are generated by varying the disease-specific use of pulmonary services ± 10%. The darker supply bounds are generated by varying the number of hours worked by specialists ± 10% while the lighter upper supply bound represents reallocation of 50% of internal medicine hours by pulmonologists to pulmonary medicine.

Current and Projected Workforce Requirements for Care of the Critically Ill and Patients With Pulmonary Disease. Can We Meet the Requirements of an Aging Population? Angus *et al*. JAMA. 2000;284(21):2762-2770.

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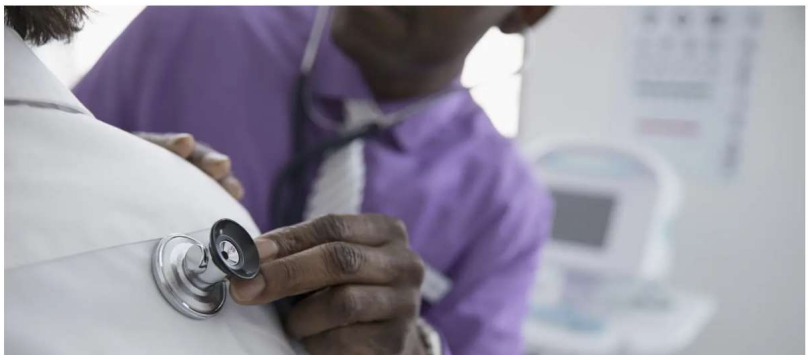
9 Things to Know About the Pulmonologist Shortage

An aging workforce and growing demand is putting pressure on the delivery of pulmonology care.



Healthgrades for Professionals, June 2023

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1. **The pulmonologist shortage has been going on for a while.**
2. COVID-19 made the physician shortage worse for all specialties.
3. **Burnout may be one reason pulmonologists are leaving the field early.**
4. **The aging population is a key factor in the pulmonologist shortage.**
5. Pediatric pulmonologists and other subspecialties are in high demand.
6. ***The pulmonologist shortage is worse in rural areas.***
7. Funding for pulmonologist training is more important than ever.
8. ***Advanced practice practitioners can help fill the gap.***
9. Telemedicine is helping ICUs manage the pulmonologist shortage.

Healthgrades for Professionals, June 2023

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PULMONOLOGIST

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PULMONARY ADVANCED PRACTICE PROVIDER (APP)

- Advancing scope of practice
- Projected surplus
- Cost-effective
- Acceptance by patients and referring providers ??

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PULMONOLOGIST *AND* PULMONARY APP MODEL

- Pulmonologist sees new patients first visit (i.e. monthly outreach clinic)
- APP provides subsequent care and acute care visit (i.e. weekly outreach clinic)
- Real-time communication within the team
- Larger footprint for the team (more outreach clinics and more patients)

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RURAL TELEMEDICINE

Telehealth potential benefits including the following quantifiable benefits:

- Decreased patient transportation costs
- Minimizing patient lost wages
- Reduced hospital staffing costs
- Increased local lab and pharmacy revenues

Less quantifiable benefits include:

- Increased access to specialists
- Providing timely care
- Ensuring patient comfort
- Reducing need for transportation
- Benefits to the provider (less isolation)
- Improved patient outcomes

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RURAL TELEMEDICINE

- Many opportunities, but many challenges!!
- Studies show that more than one in three U.S. households headed by a person 65 or older does not have a desktop or laptop computer and fewer than half have a smartphone device
- According to a 2020 study featured in JAMA, 38% of the elderly were not ready to participate in telehealth visits because of unfamiliarity with technology or physical or cognitive difficulties
- Older, more rural, and minority populations are disproportionately affected by barriers to accessing Web-based services and are more likely to rely on audio only services
- Although audio-only services can reach more vulnerable groups, research also shows that telephonic care is not as robust in certain clinical contexts

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MPC ESCAPE CLINIC

- **E**xpedited **S**ymptomatic **C**OPD and **A**sthma **P**ulmonary **E**valuation Clinic
- Staffing:
  - Pulmonologist
  - Dedicated pulmonary APP and nurse
    - -Certified asthma educator
    - -Nicotine cessation expert
    - -Biologic coordinator
  - Registered Respiratory Therapist
    - -Spirometry/PFTs
    - -Protocolized alpha-1 testing
    - -6MWT
    - -Pulmonary Rehabilitation referral

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MPC ESCAPE CLINIC SERVICES

- Guideline-based care (GINA and GOLD)
- Reliable CAT and AirQ utilization to review symptoms and risk
- Consistent Biomarker and Alpha-1 testing
- Inhaler demonstration
- Action plans/self-directed care
- Vaccinations
- ***Enrollment in clinical trials***
- ***Early initiation of biologics***
- ***Evaluation for bronchoscopic lung volume reduction***

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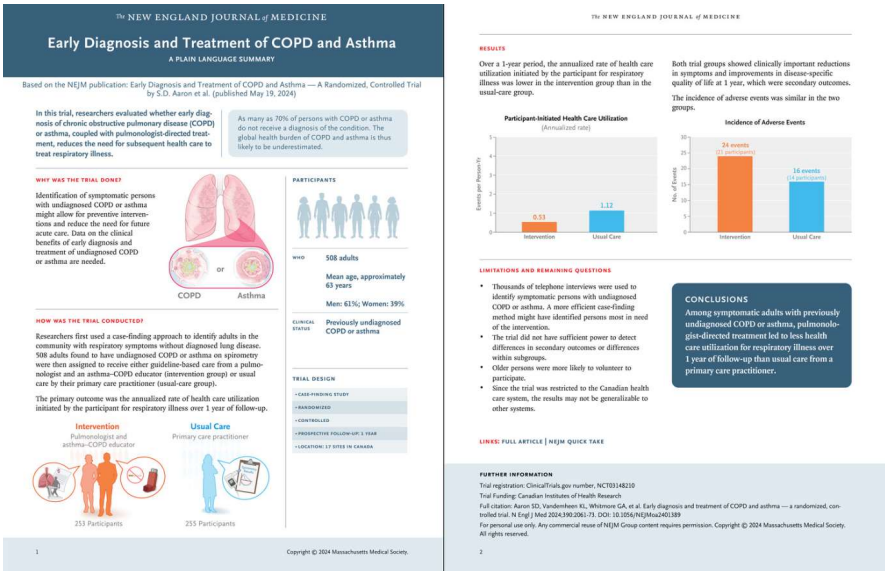
ASTHMA AND COPD CASE FINDING APPROACH



The NEW ENGLAND JOURNAL of MEDICINE

Early Diagnosis and Treatment of COPD and Asthma

A PLAIN LANGUAGE SUMMARY

Based on the NEJM publication: Early Diagnosis and Treatment of COPD and Asthma — A Randomized, Controlled Trial by S.D. Aaron et al. (published May 19, 2024)

In this trial, researchers evaluated whether early diagnosis of chronic obstructive pulmonary disease (COPD) or asthma, coupled with pulmonologist-directed treatment, reduces the need for subsequent health care to treat respiratory illness.

As many as 70% of persons with COPD or asthma do not receive a diagnosis of the condition. The global health burden of COPD and asthma is thus likely to be underestimated.

WHY WAS THE TRIAL DONE?

Identification of symptomatic persons with undiagnosed COPD or asthma might allow for preventive interventions and reduce the need for future acute care. Data on the clinical benefits of early diagnosis and treatment of undiagnosed COPD or asthma are needed.

COPD or Asthma

PARTICIPANTS

WHO: 508 adults

Mean age, approximately 65 years

Men: 61%; Women: 39%

CLINICAL STATUS: Previously undiagnosed COPD or asthma

HOW WAS THE TRIAL CONDUCTED?

Researchers first used a case-finding approach to identify adults in the community with respiratory symptoms without diagnosed lung disease. 508 adults found to have undiagnosed COPD or asthma on spirometry were then assigned to receive either guideline-based care from a pulmonologist and an asthma–COPD educator (intervention group) or usual care by their primary care practitioner (usual-care group).

The primary outcome was the annualized rate of health care utilization initiated by the participant for respiratory illness over 1 year of follow-up.

TRIAL DESIGN

- CASE-FINDING STUDY
- RANDOMIZED
- CONTROLLED
- PROSPECTIVE FOLLOW-UP: 1 YEAR
- LOCATION: 17 SITES IN CANADA

Intervention: Pulmonologist and asthma–COPD educator — 253 Participants

Usual Care: Primary care practitioner — 255 Participants

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The NEW ENGLAND JOURNAL of MEDICINE

RESULTS

Over a 1-year period, the annualized rate of health care utilization initiated by the participant for respiratory illness was lower in the intervention group than in the usual-care group.

Both trial groups showed clinically important reductions in symptoms and improvements in disease-specific quality of life at 1 year, which were secondary outcomes.

The incidence of adverse events was similar in the two groups.

Participant-Initiated Health Care Utilization (Annualized rate)

Events per Person-Yr

0.53 — Intervention

1.12 — Usual Care

Incidence of Adverse Events

No. of Events

24 events (21 participants) — Intervention

16 events (14 participants) — Usual Care

LIMITATIONS AND REMAINING QUESTIONS

- Thousands of telephone interviews were used to identify symptomatic persons with undiagnosed COPD or asthma. A more efficient case-finding method might have identified persons most in need of the intervention.
- The trial did not have sufficient power to detect differences in secondary outcomes or differences within subgroups.
- Older persons were more likely to volunteer to participate.
- Since the trial was restricted to the Canadian health care system, the results may not be generalizable to other systems.

CONCLUSIONS

Among symptomatic adults with previously undiagnosed COPD or asthma, pulmonologist-directed treatment led to less health care utilization for respiratory illness over 1 year of follow-up than usual care from a primary care practitioner.

LINKS: FULL ARTICLE | NEJM QUICK TAKE

FURTHER INFORMATION

Trial registration: ClinicalTrials.gov number, NCT03148210

Trial Funding: Canadian Institutes of Health Research

Full citation: Aaron SD, Vandemheen KL, Whitmore GA, et al. Early diagnosis and treatment of COPD and asthma — a randomized, controlled trial. N Engl J Med 2024;390:2061–73. DOI: 10.1056/NEJMoa2401389

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MOBILE ESCAPE UNIT

Description

- Mobile unit to identify symptomatic patients with asthma and COPD in surrounding at risk rural communities (undiagnosed and/or without subspecialist)
- Goal - Improve outcomes and health care utilization in symptomatic patients with asthma and COPD in at-risk rural communities (ATLAS data)

Exam and testing

- Vital signs – 6MWT if hypoxemic or borderline
- Pre-post Spirometry – protocolized alpha-1 testing if obstruction present
- CBC with differential, FeNO, Region 9 IgE specific allergy testing
- Smoking inventory and smoking cessation brochure
- CAT and AirQ baseline score

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MOBILE ESCAPE UNIT

Follow-up

- Patients with AirQ≥2 or CAT≥10
- ESCAPE clinic, Pulmonary Outreach Clinic, or Virtual Clinic
- Receive guideline-based recommendations

Outcomes

- Track exacerbation rates and health care utilization
- Trend community ATLAS data quarterly
- Trend CAT and AirQ scores
- Track maintenance inhaler and biologic use
- Describe Type 2 inflammation prevalence in symptomatic asthma and COPD patients in high-risk rural population

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CONCLUSIONS

- Multiple barriers to healthcare access exist in rural communities impacting life expectancy and other quantifiable health outcomes
- Innovative IT applications can be utilized to identify the most vulnerable patients with respiratory disease in the most at-risk communities
- Novel subspecialty outreach models have an opportunity to mitigate health related disparities between urban and rural patients

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THANK YOU!!

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