2024 ESO FIRE SERVICE INDEX

INSIGHTS AND BEST PRACTICES FOR FIRE DEPARTMENTS

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CONTEXT AND OVERVIEW FOR THE INDEX

In 2024, data is taking center stage in the fire services industry. With The National Emergency Response Information System (NERIS) set to replace NFIRS within the next year, we're about to experience the biggest change to emergency reporting standards in the last 50 years. NERIS will minimize the need for excess data entry, allowing departments to improve decision-making by accessing their data in near real-time.

Putting data at the forefront is invaluable at both an industry an organizational level. By providing insights into the value they provide, fire departments can demonstrate budget needs to serve the community. They can also use data to see which areas are opportunities for improvement for firefighter safety and wellness, as well as target efforts toward community risk reduction. At an even higher level, aggregated data allows the industry to see what is working and what's not, which areas to invest in, and even how to define the services the industry provides.

The 2024 ESO Fire Service Index is a resource that helps empower organizations and the industry to use data to do all of the above. It offers insights compiled from across the United States to give departments visibility into where they stand against national benchmarks. Further, comparing local performance to this national assessment can allow departments to make calculated changes that lead to improved performance. Now in its fifth edition, the 2024 Fire Service Index provides a closer look into some of the metrics included in previous editions, such as incident types and first apparatus times, along with new metrics, including outdoor and wildland fires. Here are a few questions we hope the Index helps your organization answer using your data:

What are our most common response types overall? Among fire calls?
How many of our responses are EMS compared to fire?
For fire calls, what are the most common property types we respond to?
What are the most prevalent types of outdoor fires?
How quickly do we respond to a call on average?
How frequently are firefighters documenting decontamination procedures?

The Fire Service Index offers an objective look at aggregate data from across the United States, so you can better understand how your department is performing in specific areas. That said, there are many factors to consider when measuring where your organization stands against the national average, including your population size and location. Take this as an opportunity to develop data-driven strategies for increasing efficiency, improving outcomes, and better allocating resources for your organization.

The 2024 ESO Fire Service Index report uses data compiled from 2,269 participating agencies and represents 6,522,791 incidents from January 1- December 31, 2023. We hope you find this Fire Service Index report helpful in achieving your performance goals.



GLOSSARY

Incident: Any situation in which emergency services organizations respond to deliver emergency services, including rescue, fire suppression, emergency medical care, special operations, and other forms of hazard control and mitigation.

Mutual Aid: Lending assistance across jurisdictional boundaries.

Automatic Aid: Assistance provided through a contractual agreement between agencies for preset response on reported call types.

LIMITATIONS

This Index is retrospective and looks at aggregate data from January 1- December 31, 2023. There are no universal rules designed around these trends. The purpose of the Index is to be informative and directional, but it is not intended to be a scientific study — nor is it intended to be comprehensive in nature. We hope this Index serves as a body of literature that adds to the discussion and conversation around best practices for each of the selected metrics to help improve community health and safety.

KEY METRICS



MOST COMMON INCIDENT TYPES



STRUCTURE FIRES



OUTDOOR FIRES



FIRST APPARATUS TIMES



DECONTAMINATION PRACTICES



CRITICAL INCIDENTS

KEY FINDINGS

The 2024 ESO Fire Service Index report looked at 6,522,791 incidents from January 1 - December 31, 2023. At a macro level, the data revealed the following findings:

Residential properties accounted for 80% of fire calls (100 series).

2023 80%

2023

42K+

There were over 42K wildland fire incidents in 2023.



67%

of all incidents, while 100-series Fire responses accounted for 3% of all calls.



Series 110

Series 150

Series 140

3%

FIRE

RELATED

CALLS

67%

RELATED CALLS

EMS

The most common types of fire responses include structure fire at 36% (Series 110), outside rubbish fire at 21% (Series 150), and natural vegetation fire at 21% (Series 140).

Out of the 5k critical incidents reported last year, 79% of the records did not include documentation of the circumstances. 79%

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76% of firefighters with documented exposure had at least one decontamination procedure noted.

Median first apparatus turnout times, travel times, and response times aligned with NFPA 1710 benchmarks.





FIRE SERVICE INDEX



Tracking the breakdown of incidents from year to year allows us to identify trends so fire departments can see how their most common incident types compare nationally. This can help them with everything from better understanding how to direct community fire prevention efforts, updating fire codes, to knowing which areas require more assistance. Continuing to track how their organization is doing from year to year allows them to see how their community is changing over time along with their service needs.

At a higher level, tracking incident types can give the industry insight into everything from which parts of the country are most impacted by severe weather, where to direct research and resources to prevent firefighters' deaths, how to recognize areas that could most benefit from preventive measures such as fire alarms and sprinklers.

Chart 1 shows the breakdown of all incident types. Overall, the data matches what we saw in 2022, with most incidents being EMS calls (Series 300).

Chart 1

COUNTS OF INCIDENTS BY INCIDENT TYPE

	0	20	40	60	80	100
SERIES 100	3%	(196K)				
SERIES 200	<1% (5K)				
SERIES 300		· •			67% (4.3	5M)
SERIES 400	2.5	% (163K)-				
SERIES 500		7% (479K	()			
SERIES 600		12% (77	70K)			
SERIES 700		7% (447K	.)			
SERIES 800	<1% (6.7K)				
SERIES 900	<1% (16.6K)				

INCIDENT TYPE GROUPS

SERIES 100:	Fire
SERIES 200:	Overpressure Rupture, Explosion, Overheat (No Fire)
SERIES 300:	Rescue & EMS Incident
SERIES 400:	Hazardous Condition (No Fire)
SERIES 500:	Service Call
SERIES 600:	Good Intent Call
SERIES 700:	False Alarm & False Call
SERIES 800:	Severe Weather & Natural Disaster
SERIES 900:	Special Incident Type

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Chart 2 shows the breakdown of categories of fire-specific incident types (Series 100).

Chart 2

COUNTS OF INCIDENTS BY INCIDENT TYPE (SERIES 100 ONLY)

	0	20	40	60	80	100
SERIES 100	4% (7.6K)				
SERIES 110			36%	(70.5K)		
SERIES 120	1% (1.8	K)				
SERIES 130		14% (27.4	K)			
SERIES 140		21% (4	41.7K)			
SERIES 150		21% (4	40.6K)-			
SERIES 160	3% (6	.0K)				
SERIES 170	.4% (7	53).				

FIRE RESPONSES

SERIES 100:	Fire, Other
SERIES 110:	Structure Fire
SERIES 120:	Fire in Mobile Property Used as a Fixed Structure
SERIES 130:	Mobile Property (Vehicle) Fire
SERIES 140:	Natural Vegetation Fire
SERIES 150:	Outside Rubbish Fire
SERIES 160:	Special Outside Fire
SERIES 170:	Cultivated Vegetation, Crop Fire

When limited to fire incidents only (100 series), the data show the three most common fire response types are structure fire (Series 110 – 36%), natural vegetation fire (Series 140 – 21%), and outside rubbish fire (Series 150 – 21%). Vehicle fires (Series 130) came in fourth at 14%.

RECOMMENDED ACTION

Natural vegetation fires are the second most common type of fire call. With changing weather patterns and greater wildfire frequency, fire departments across the board are getting impacted by wildfires, whether it is directly or indirectly through providing aid.

The best step for preventing wildland fires is through active and supported community awareness and prevention programs. These programs work with communities to create fire-wise neighborhoods, understanding the importance of cleaning up tree limbs and debris as well as adopting the Wildland Urban Interface Fire Codes to support prevention and mitigation programs before, during, and after construction in the WUI environment.

That said, it's important to be up to date on best practices for wildland fire response and have properly trained and equipped firefighters. You can find information in the extensive toolkit of resources offered by The International Association of Fire Chiefs (IAFC) and the US Forest Service.

FIRE SERVICE INDEX EMS VS. FIRE CALLS



Improvements in fire-resistant materials and community reduction programs over the years have led to a decline in fire-related incidents. At the same time, EMS has seen a surge in calls, which has led to fire departments' responsibilities to include becoming EMS providers in both transport and first response. In 2023, 67% of all calls reported were rescue and EMS-related (Series 300) compared to just 3% that were fire-based (Series 100), which is consistent with the past few years. Chart 3 shows the breakdown of calls for EMS versus fire incidents in relation to all incident types.

Chart 3

EMS-BASED INCIDENTS VS. FIRE-BASED INCIDENTS



TYPE OF INCIDENTS



RECOMMENDED ACTION

Continue to develop alternatives to 911 EMS responses in your community. This can be done by partnering with social service, mental health, and public health organizations to provide preventive and routine programs to the community without EMS intervention.

An increase in risk reduction strategies may help decrease EMS call volume. Joint programs such as fall prevention, wellness education, medication assistance, and overdose prevention go far in impacting the health and safety of your community while helping to divert non-emergency calls to free up EMS capacity.

FIRE SERVICE INDEX STRUCTURE FIRES

The core mission of the fire service has always been to save lives and limit property damage. Structural firefighting stands as one of the most challenging and risky operations, involving rapid decisions and precise actions to mitigate the damage and danger of fires within buildings. Exploring the specifics of structural fires uncovers key insights like the most common locations for these fires, the frequency of working events, and the impact of support systems including automatic extinguishing systems. Understanding these can help fire departments towards their mission, by seeing where they can refine their tactics and better serve their communities.

Chart 4 below shows that in the reported period, there were 28,271 incidents classified under structural fires. 63% of these were classified as working fires, indicating situations demanding a full deployment of firefighting resources. Meanwhile, chart 5 shows that only 7% of these cases had automatic extinguishing systems present, highlighting room for improvement.

Chart 4

PERCENTAGE OF WORKING STRUCTURE FIRES

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Total Structure Fire Incidents (Incident Type Code 111): **28,271**

Chart 5

AUTOMATIC EXTINGUISHING SYSTEM PRESENT



FIRE SERVICE INDEX STRUCTURE FIRES

Chart 6 shows that the majority of structural fires (80%) occurred in residential settings, emphasizing the need for focused fire prevention and safety measures in homes.



Chart 7 takes a closer look at those residential fires and shows that specifically, one- or twofamily dwellings represented 77% of residential fire incidents, making them the primary concern for fire safety initiatives as civilian injury and death are still most prominent in the home.

Chart 6

STRUCTURE FIRE INCIDENTS BY PROPERTY USE CATEGORY



Chart 7

RESIDENTIAL FIRES BY PROPERTY USE CATEGORY



PERCENT OF RESIDENTIAL PROPERTY BY TYPE

77%	419	2%	ALL OTHER TYPES
18%	429		(439, 449, OTHER)
3%	400		

PROPERTY USE CODES

100: Assembly
200: Educational
300: Healthcare, Detention, Correction
400: Residential
500: Mercantile, Business
600: Industrial, Utility, Defense, Agriculture, Mining
700: Manufacturing, Processing
800: Storage
900: Outside or Special Property

RESIDENTIAL USE CODES

- 400: Residential, Other
- 419: 1 or 2 Family Dwelling
- 429: Multifamily Dwelling
- 439: Boarding/Rooming House, Residential Hotels
- 449: Hotel/Motel, Commercial

FIRE SERVICE INDEX STRUCTURE FIRES



RECOMMENDED ACTION

Educate the community on smoke detectors, cooking safety, and home evacuation plans, which all help protect lives. Partner with homeowner associations and community groups to create prevention programs and spread the message.

Work with local governments and building officials to keep building codes up to date with fire safety standards.

Promote the education and installation of residential sprinkler systems by working with home builders on the addition of the NFPA 13R standard to homes. Advocate for policies that enforce fire support codes for rental properties by requiring working smoke detectors in all living areas.

Ensure hydrants and water sources in residential areas are regularly tested and maintained while also keeping them accessible and visible from the response route. This will allow for better access to water, assisting in operational tactics for the first arriving units.

FIRE SERVICE INDEX OUTDOOR FIRES

Wildland and outdoor fires have become a significant concern across North America, with damage impacting communities that border natural areas. As urban development expands, wildlandurban interface (WUI) environments increase along with the potential of fires started by human activities, electrical utilities, and unmonitored burns.

The challenge is compounded by factors such as reduced wildland fuel management, lower rainfall levels, and rising temperatures, all of which contribute to the increased size and intensity of fires. This situation demands a more focused approach from the fire service in terms of preparedness and prevention in affected areas.

In 2023, there were 82,491 outdoor fire incidents reported. Chart 8 shows the frequency of these incidents throughout the year, with a noticeable peak during the warmer months. Chart 9 breaks the incidents by type, ranging from unauthorized and controlled burns to brush and grass fires. Unauthorized burning accounted for a significant portion of these incidents at 31%.

Chart 9

TYPES OF OUTDOOR FIRES



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Chart 8

OUTDOOR FIRE INCIDENTS BY MONTH

Total Outdoor Fire Incidents: 82,491



INCIDENT TYPE CODES

- 561 Unauthorized Burning
 142 Brush Fire
 143 Grass Fire
 631 Authorized Controlled Burning
- **140** Natural Vegetation Fire Other
- 141 Forest, Woods, or Wildland Fire
- **160** Special Outside Fire Other
- 632 Prescribed Fire
- 171 Cultivated Grain or Crop Fire
- 170 Cultivated Vegetation, Crop Fire Other
- 173 Cultivated Trees or Nursery Stock Fire
- 172 Cultivated Orchard or Vineyard Fire

FIRE SERVICE INDEX OUTDOOR FIRES

With over 42,488 wildland fire incidents (limited to codes 140-143) and 237,084 acres burned, the impact of these fires is high. Similar to outdoor fires, chart 10 shows that wildland fire incidents were more frequent during the warmer months. Chart 11 reveals that the causes for these wildland fires were diverse, with the majority of incidents remaining undocumented or undetermined, though human activities and natural sources are notable contributors.

Chart 10

WILDLAND FIRE INCIDENTS BY MONTH

Total Wildland Fire Incidents: **42,488** Total Acres Burned: **237,084**





Chart 11

WILDLAND FIRE CAUSES

Not Documented	
	58%
Undetermined	
21%	
Open/Outdoor Fire	
5%	
Debris, Vegetation Burn	
4%	
Equipment	
3%	
Natural Source	
2%	
Incendiary	
2%	
Smoking	
2%	
Misuse of Fire	
2%	
Other Cause	
2%	
Structure (Exposure)	
0.06%	
Controlled Burn Out of Control	
0.01%	
Downed Powerline	
0.002%	
Electrical Transformer	
0.002%	
Open Burn	
0.002%	

FIRE SERVICE INDEX OUTDOOR FIRES

RECOMMENDED ACTION

There can be large gaps from the time the fire started to the notification of fire departments. Departments with large wildland areas should work with state and private landowners to invest in early detection devices to quickly identify fires in wildland environments, increasing the chance of early suppression. Since wildland firefighting differs from structural, ensure your crew is equipped with the proper PPE and equipment, integrate comprehensive wildland training programs such as S190/130, and develop a preplanned response strategy for high-risk areas, including evacuation routes and staging areas. Establish a permitting process for burns in high-risk areas so that fire service officials can provide education and ensure that proper precautions are in place, such as fire breaks, onsite water resources, and limited burn areas, to mitigate fire risks effectively.

FIRE SERVICE INDEX FIRST APPARATUS TIMES

Time has always played a crucial part in how successfully a fire department responds to an incident, but it isn't the only factor to consider. Stepping back and looking at the bigger picture allows departments to improve performance while taking safety and effectiveness into account.

GLOSSARY

Alarm handling: Public safety answering point (PSAP) time to alarm time.

Turnout time: Dispatch time to enroute time.

Travel time: En route time to on-scene time.

Response time: Alarm time to on-scene time.

In Charts 12 and 13, we identify the median and 90th percentile times for a range of metrics related to response time for both fire (Series 100) and EMS (Series 300) calls. For fire and EMS responses, the NFPA has set guidelines of a 4-minute or less travel time, 80 seconds for fire turnout time, and 60 seconds for EMS turnout time. For response time, the median travel time for both fire and EMS fell at the guideline. Median turnout time for both fire and EMS fell just lower than the recommended times.

Chart 12

FIRST APPARATUS ON SCENE TIME BREAKDOWNS (FIRE)

FIRE (SERIES 100)



Chart 13

FIRST APPARATUS ON SCENE TIME BREAKDOWNS (EMS)

EMS (SERIES 300)



RECOMMENDED ACTION

Incorporating a timer with a notification system allows you to track turnout times and provide actionable feedback to your crew to help improve performance. It's important to note your department's circumstances when setting goals. The NFPA 1710 standard was designed primarily for communities with career or paid firefighters, whereas the NFPA 1720 standard was designed for communities with volunteer firefighters. Using the right standards as a benchmark for your own data and collaborating with leaders within your community allows you to create the right baselines for your organization and report back on your performance.

Finally, by completing reports immediately after all units are clear, you improve their accuracy, which could be beneficial to future responders working in the same areas.

FIRE SERVICE INDEX DECONTAMINATION

Out of the dangers associated with the industry, cancer is the leading cause of death for firefighters. A multi-year study conducted by the National Institute for Occupational Safety and Health (NIOSH) found that firefighters had a 9% increase

in cancer diagnoses and a 14% increase in cancerrelated deaths over the general U.S. population. There are ways to mitigate cancer risks, including

the proper use and decontamination of PPE for every incident. The more documentation around decontamination procedures such as wet-soap decontamination and commercial wet wipes usage, the better we can understand what is most effective in preventing cancer. Because of its importance, decontamination documentation is once again a metric in the 2024 Fire Service Index.

In 2023, there were 47,908 personnel exposures to fire/smoke during 10,905 working fire incidents. Out of these exposures, 76% documented at least one decontamination procedure Chart 14 shows that nearly 24% of firefighters didn't document any decontamination procedures after a working fire.

Chart 14

FIREFIGHTER DECONTAMINATION PROCEDURES DOCUMENTED AFTER A WORKING FIRE



FIRE SERVICE INDEX DECONTAMINATION

RECOMMENDED ACTION

The importance of fire decontamination procedures cannot be stressed enough. Emphasize decontamination education from the start of training and continue to emphasize its importance and retrain periodically to ensure your team prioritizes it daily. Provide physicals and cancer screenings for your team yearly in addition to following the 11 best practices for cancer prevention as outlined in the **Lavender Ribbon Report** for Preventing Firefighter Cancer¹ by the International Association of Fire Chiefs and the National Volunteer Fire Council:

- Wear full personal PPE throughout the entire incident, including a self-contained breathing apparatus (SCBA) during salvage and overhaul.
- 2. Provide a second hood for all entrycertified personnel in the department.
- 3. After exiting the immediately dangerous to life or health (IDLH), use soapy water and a brush as soon as possible to begin gross decontamination of PPE. Place PPE in a sealed plastic bag in an exterior compartment of the rig, or if in a personally owned vehicle (POV), place in a large storage tote and keep away from passengers.
- 4. Immediately use wipes, which must be carried on all apparatus, to remove soot from head, neck, jaw, throat, underarms, hands, and any exposed areas.
- 5. Change and wash clothes immediately after exposure or isolate them in a trash bag until washing becomes available.

- 6. Shower within an hour or as soon as possible after exposure.
- 7. Prohibit PPE in areas outside the apparatus floor (i.e., kitchen, sleeping areas, etc.) and should never be stored in the household.
- Regularly clean and decontaminate the apparatus seats, SCBA, and interior crew areas with soap and water or wipes – especially after exposure.
- 9. Schedule an annual medical exam, as early detection and treatment are key to survival.
- 10. Avoid tobacco of any variety, including dip and e-cigarettes.
- 11. Fully document all fire or chemical exposures on incident and personal exposure reports.

The results from this Index for decontamination performance agree with a recently published **ESO study** that used data from the ESO Data Collaborative, to examine, on-scene decontamination procedures among fire personnel with a documented smoke or combustion product exposure. That study also found that only 4% documented all on-scene decontamination procedures defined as best practices, which means that we have a lot of room for improvement.² By doing your part to document exposures, you're not only doing your part to keep your team safe but also providing data to help organizations such as the National Firefighter Register create best practices, legislation, and guidelines for protecting firefighters across the industry.

FIRE SERVICE INDEX CRITICAL INCIDENTS

It's no secret that fire service is an incredibly physically and mentally demanding industry, which is why it's incredibly important that the wellbeing of emergency personnel is finally getting the spotlight it deserves. This metric focuses on firefighter exposure to the nine critical incidents that have the highest potential to be psychologically traumatizing:

- Serious injury or line of duty death
- Suicide of a co-worker
- Death or serious injury to a child
- Prolonged failed rescue
- Multi-casualty incident disaster
- Victim is known to the responder
- Any incident where the personal safety of the responder is jeopardized
- Incidents with excessive media interest, and
- Any incident with an unusually strong emotional component.

Nearly 22% of fire service members are expected to experience PTSD at some point in their careers. Exposure to critical incidents is closely linked to PTSD and suicide, making their documentation crucial. With the right assistance and support, many firefighters who experienced PTSD can recover to return to work successfully.

It's important to note that there is no set list of criteria that makes an incident critical, but rather exposure results from an individual's response to a set of circumstances. The term psychologically traumatizing event (PTE) is also used to recognize this distinction.

Chart 15 below looks at the most common circumstances related to critical incidents while chart 16 breaks down the most common incident types recorded by firefighters. There is a major opportunity for greater documentation of critical incidents as 79% of the records did not include documentation of the circumstances surrounding the critical incident.

Chart 15

CRITICAL INCIDENTS BY CIRCUMSTANCE

TOTAL CRITICAL INCIDENTS: 5,115



FIRE SERVICE INDEX CRITICAL INCIDENTS

Chart 16

MOST COMMON INCIDENT TYPES



RECOMMENDED ACTION

It's important to remember that everyone reacts differently to the same or similar incidents, so personalize treatment to each person's individual needs. By providing education and support around the signs and symptoms of PTSD, stress disorders, and addiction, while also creating a positive environment around mental health in general, you can empower your team to recognize a need and reach out to those around them. Recognizing the importance of work relationships and promoting an atmosphere of respect and fairness goes a long way in promoting mental health. Make sure your agency has access to Peer Support programs, training, and mental health professionals who are trained and equipped to work with firefighters. Share important contact numbers, such as the National Suicide Prevention Lifeline (1-800-273-TALK [8255]), along with online resources such as **www.pocketpeer.org**. Finally, put in place stringent policies around bullying and harassment.

METHODOLOGY

The dataset for the 2024 ESO Fire Service Index report is real-world data, compiled and aggregated from 6,522,791 incidents that occurred between January 1 – December 31, 2023 across the United States.

Use the 2024 ESO Fire Service Index as a guide for better analyzing and understanding your own data in the selected areas. While the metrics are not meant to be exhaustive, they are a good benchmark for creating your own goals for your organization. It's important to note that your department is unique in its own strengths and structure, so hitting the national average may not be attainable for every metric.

ESO'S MISSION

ESO's mission is to improve community health and safety through the power of data. That is why we produce our suite of Indices—the Fire Service Index, the EMS Index, and the Trauma Index—annually. Our mission drives which metrics we analyze, whether tied to quality and process improvement, community health, or provider safety. We make the Indices publicly available at no cost because we believe it is the right thing to do to not only fulfill our mission, but to help improve the industries that we serve.

ABOUT ESO

ESO (ESO Solutions, Inc.) is dedicated to making a difference by improving community health and safety through the power of data. Since its founding in 2004, ESO continues to pioneer innovative, clinical software applications to meet the changing needs of today's hospitals, EMS agencies, fire departments, and federal and state governments. ESO currently serves thousands of customers throughout North America with a broad software portfolio, including the first-of-its-kind healthcare interoperability platform connecting clinical data across the patients continuum of care with our ESO Patient Registry, ESO Health Data Exchange (HDE), ESO Electronic Health Record (EHR), the next-generation ePCR; ESO Fire RMS, the modern fire Record Management System; and ESO State **Repository**. ESO is headquartered in Austin, Texas. For more information, visit www.eso.com.

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CITATIONS

¹ Lavender Ribbon Report Update. 2021. Available at: https://www.nvfc.org/wp-content/ uploads/2021/09/Lavender-Ribbon-Report-Updateonline.pdf.

² Fernandez AR, Treichel A, Myers JB, Bourn SS, Crowe RP, Gardner B. Evaluating Firefighter On-Scene Decontamination Practices Using a National Fire Records Management System. J Occup Environ Med. 2023 Nov 1;65(11):931-936. doi: 10.1097/ JOM.00000000002927. Epub 2023 Aug 3. PMID: 37550953; PMCID: PMC10662600.

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