

# Unhealthy Years and Life-Years Lost Attributable to Air Particulate Matter in Asia-Pacific Region

**Pattheera (Paire) Somboonsin and Vladimir Canudas-Romo**

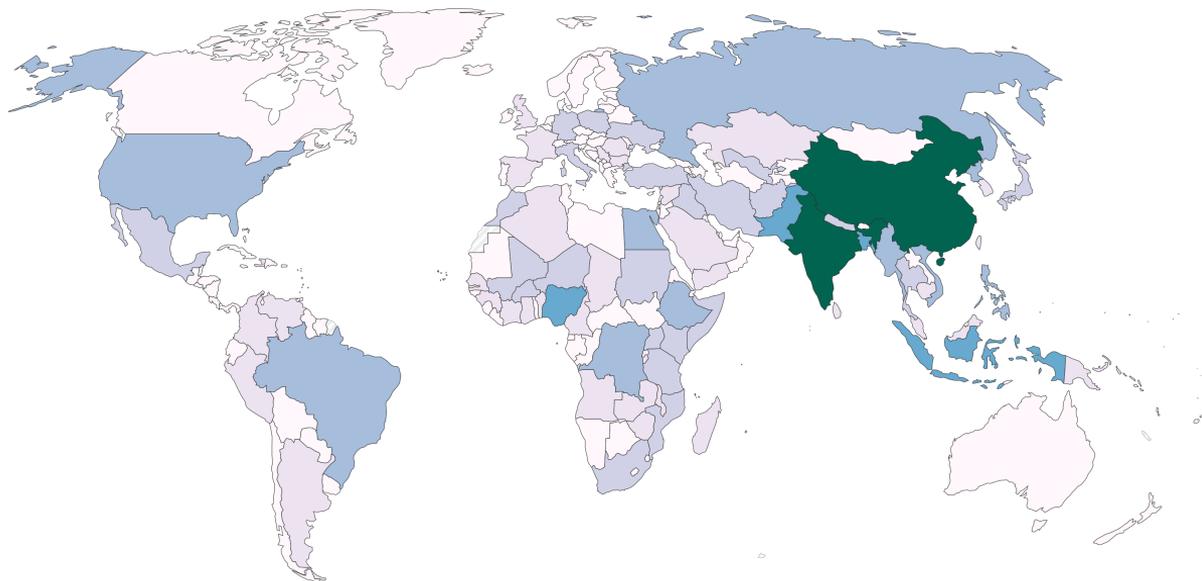
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# How many people die from air particulate matter pollution in recent year?

18% of all deaths were from air particulate matter



**4<sup>th</sup>**  
highest-ranking  
risk factor for  
death

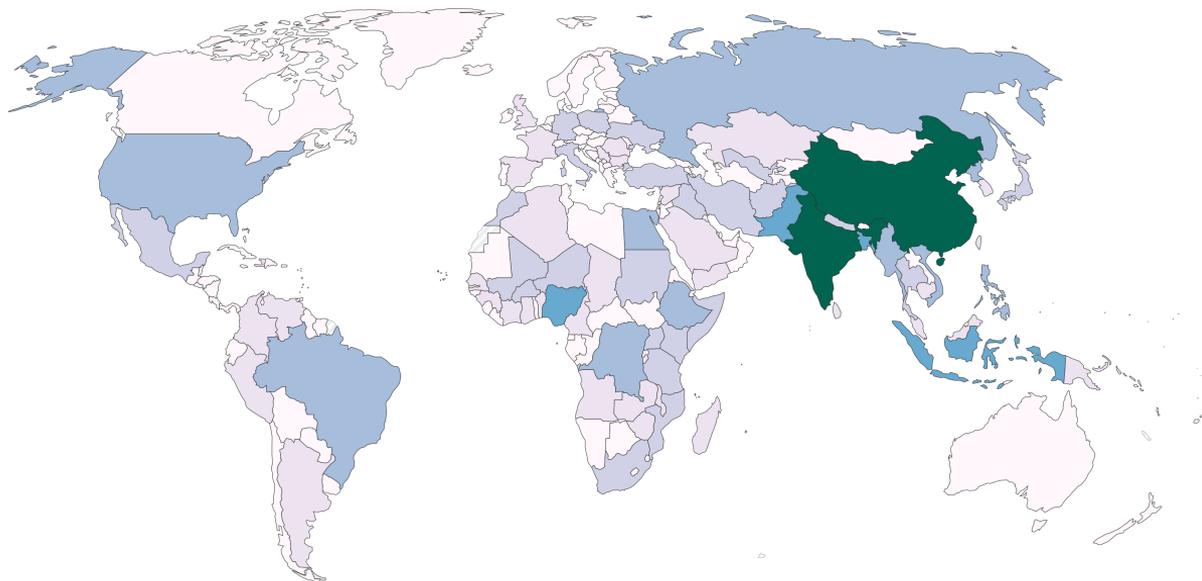


Source: IHME, Global Burden of Disease (2019)



# How many people die from air particulate matter pollution in recent year?

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**4<sup>th</sup>**  
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**7 million deaths every year**

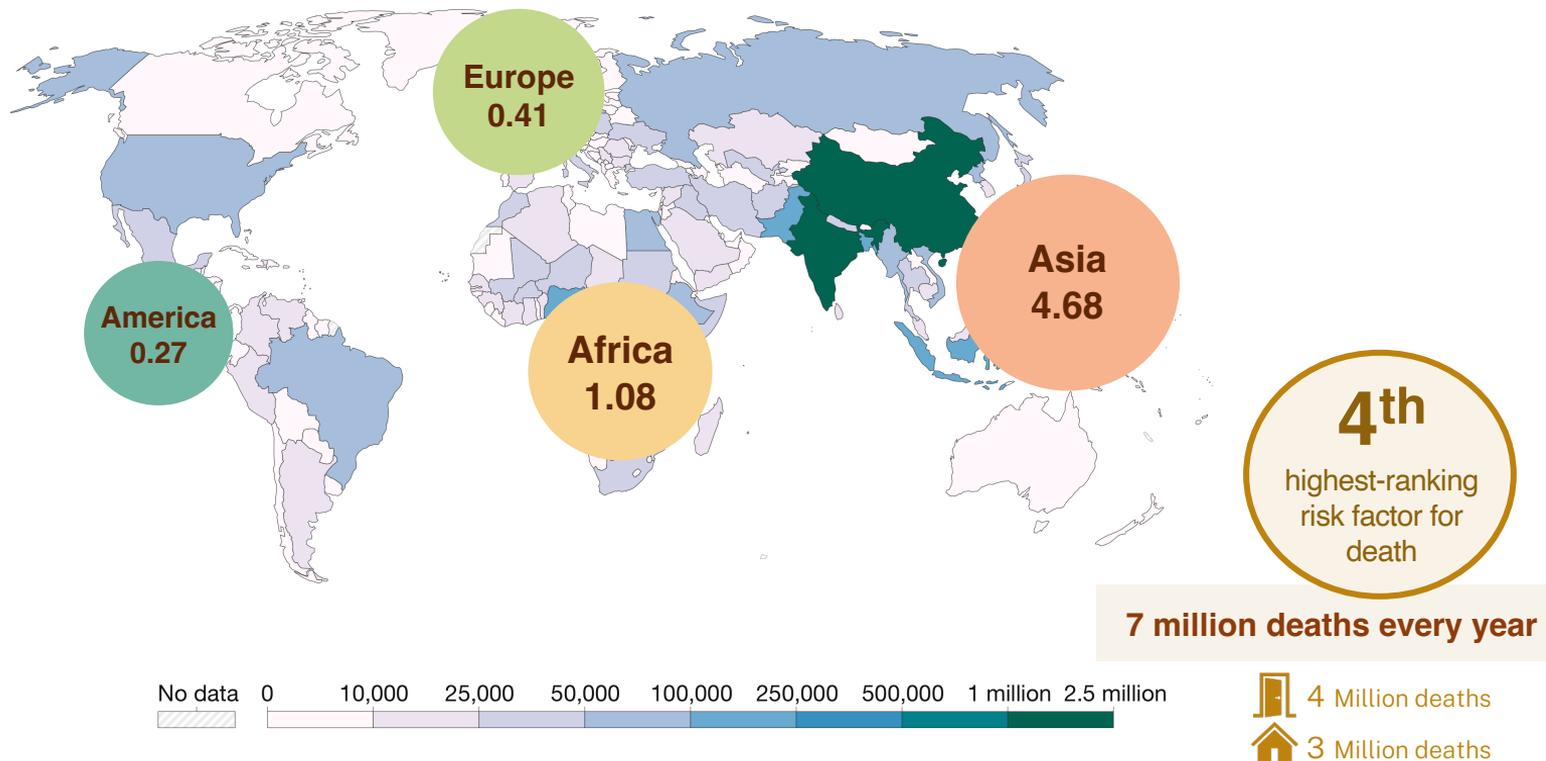


 4 Million deaths  
 3 Million deaths

Source: IHME, Global Burden of Disease (2019)

# How many people die from air particulate matter pollution in recent year?

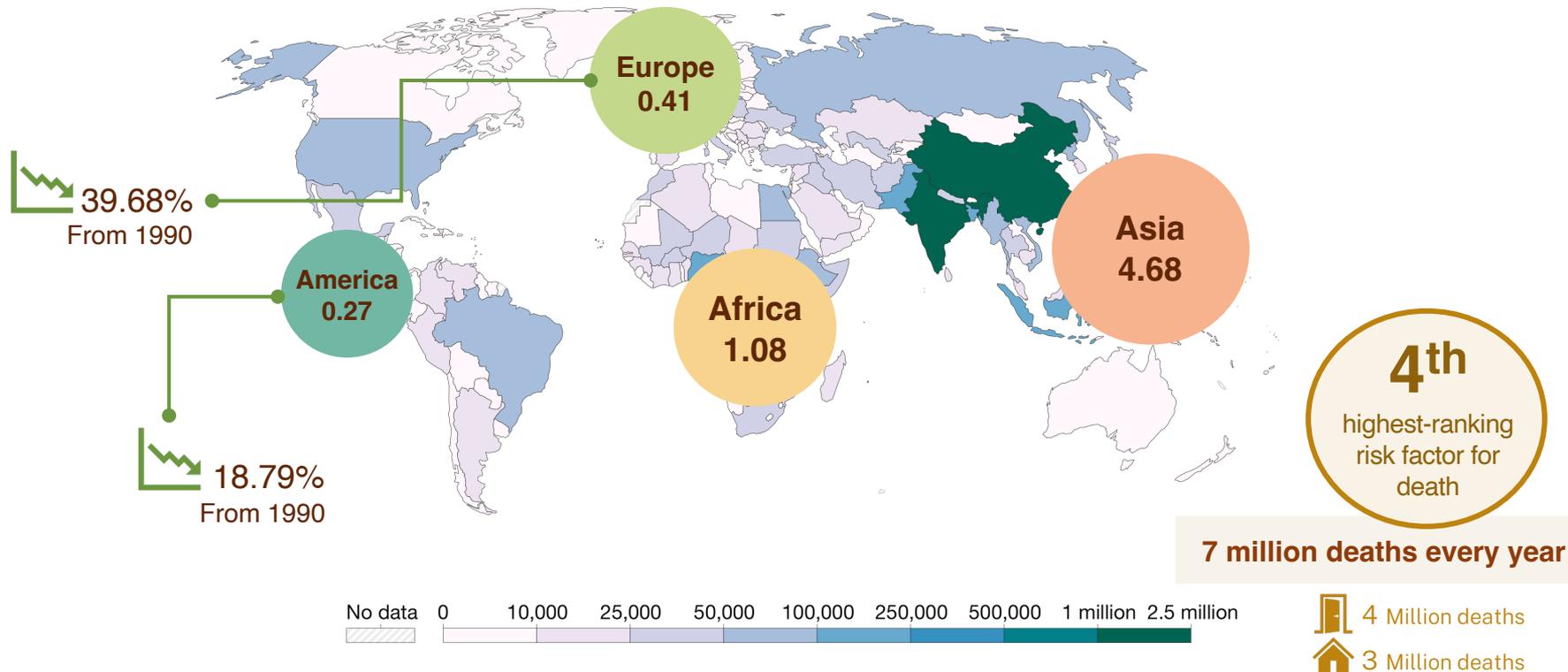
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Source: IHME, Global Burden of Disease (2019)

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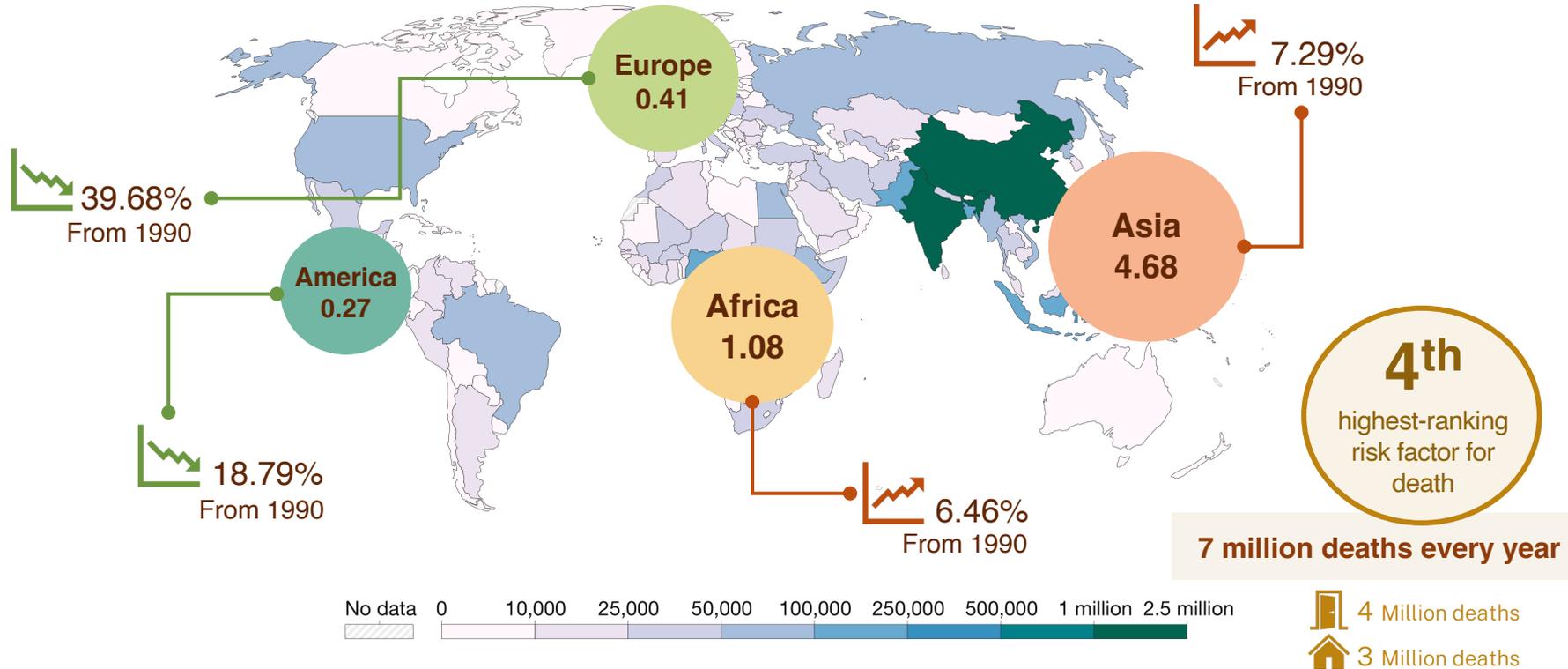


Source: IHME, Global Burden of Disease (2019)



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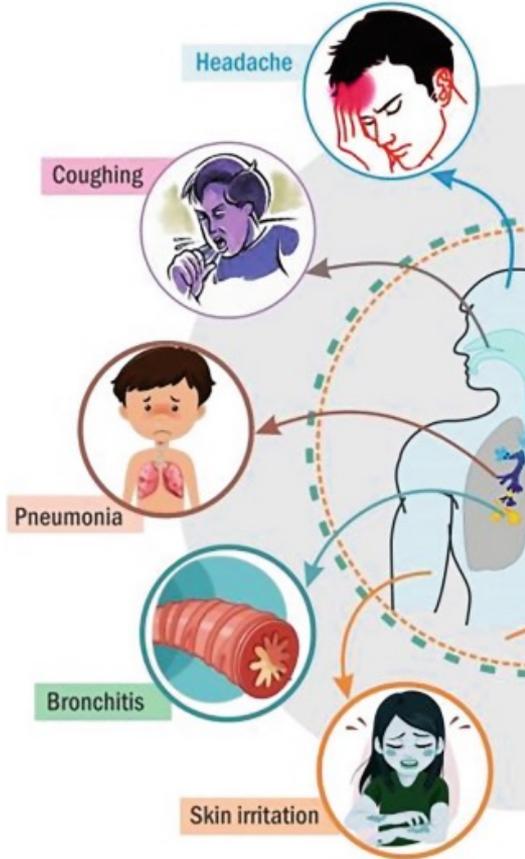


Source: IHME, Global Burden of Disease (2019)



# Effects from air pollution

## Short-term effects

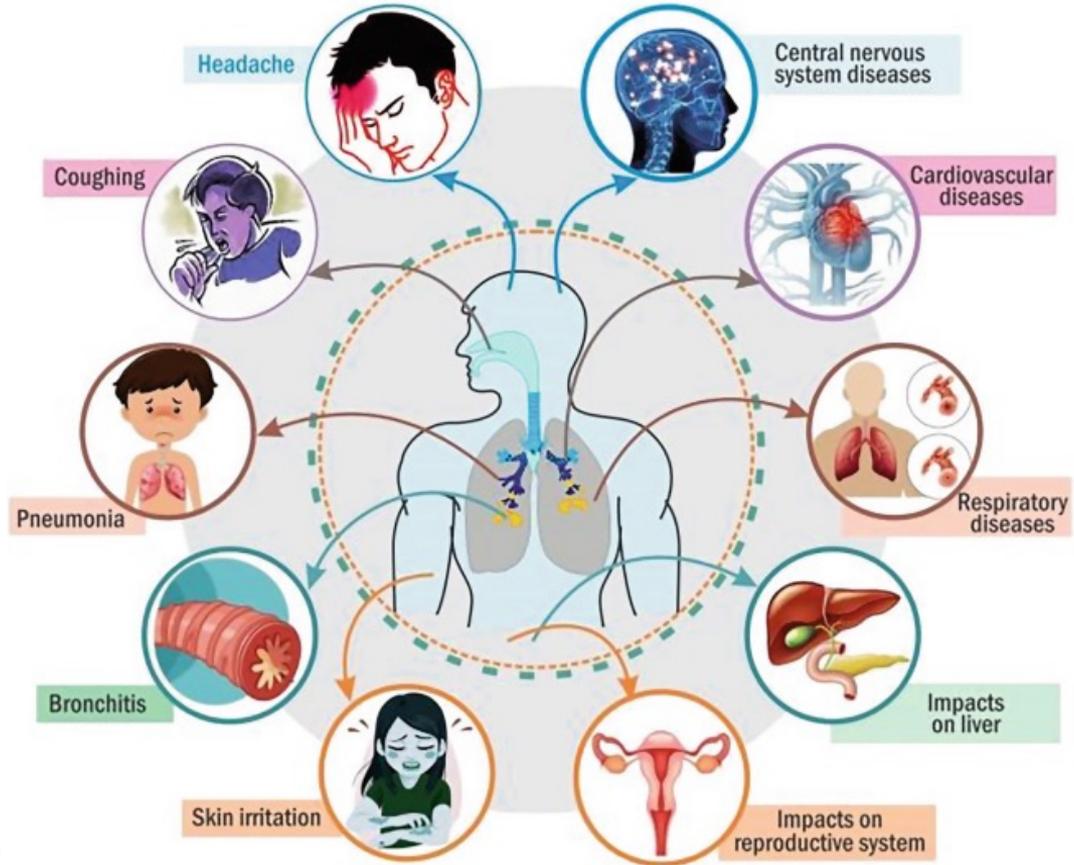


Source: Mikael Häggström (2012)

# Effects from air pollution

## Short-term effects

## Long-term effects



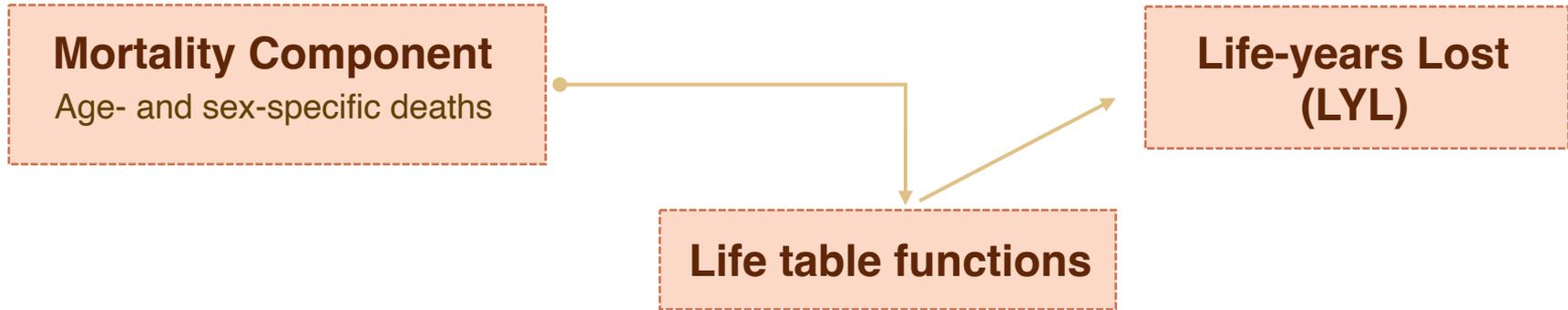
Source: Mikael Häggström (2012)

# AIMS

To quantify and compare the burden of unhealthy years (UY) and life-years lost (LYL) resulting from household air pollution from solid fuels (HAP) and ambient particulate matter (APM) from 1990 to 2019 across various countries, genders and age groups within Asia-Pacific region.

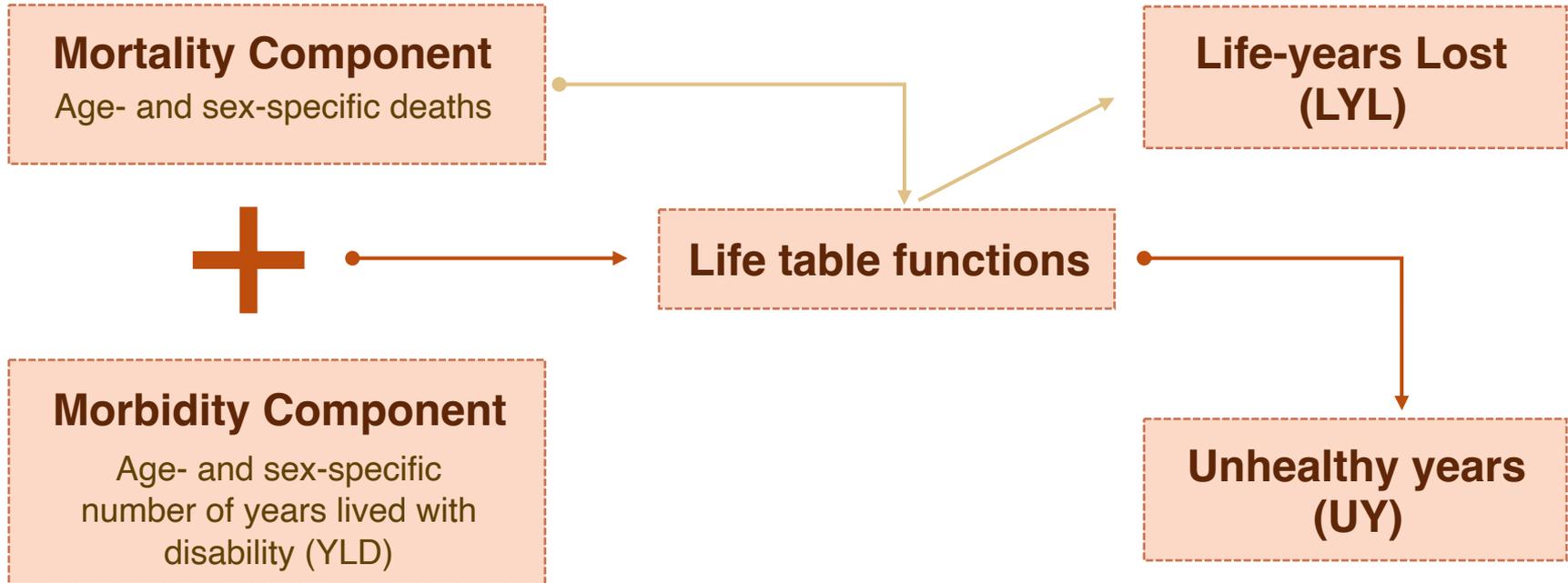
# METHODOLOGY

**Data Source: Institute for Health Metrics and Evaluation (IHME)**



# METHODOLOGY

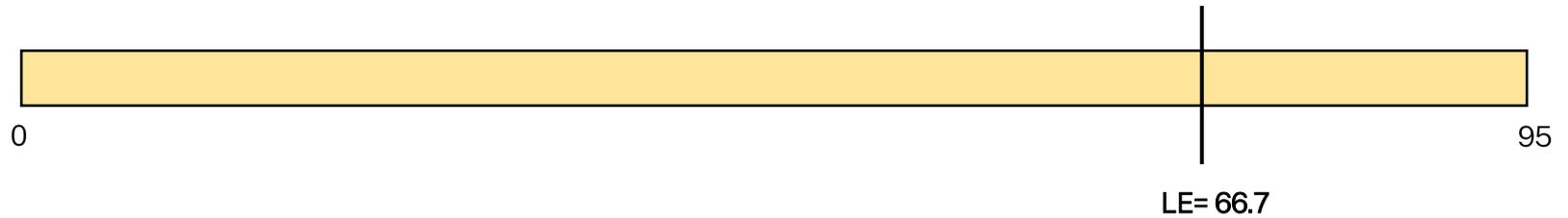
Data Source: Institute for Health Metrics and Evaluation (IHME)



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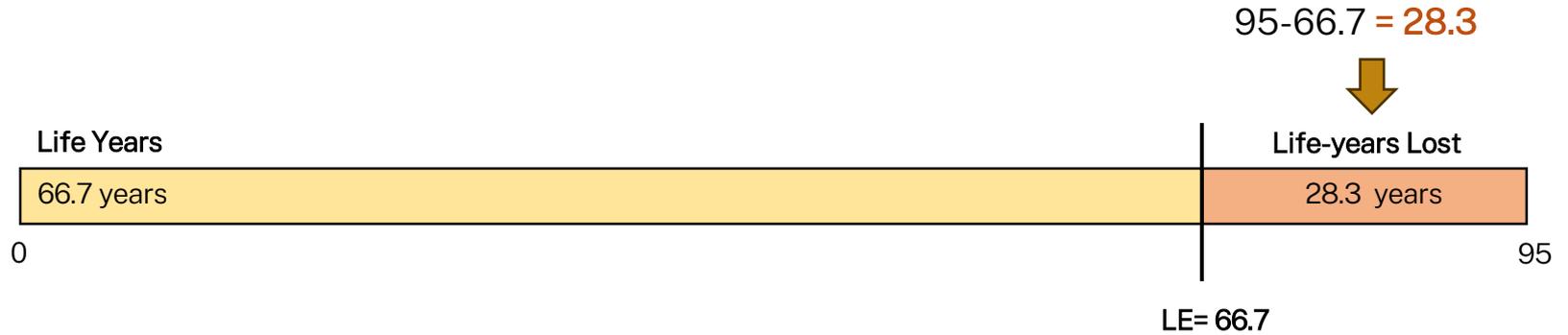


# METHODOLOGY



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$$95 = {}_{95}e_0 + {}_{95}\theta_0$$



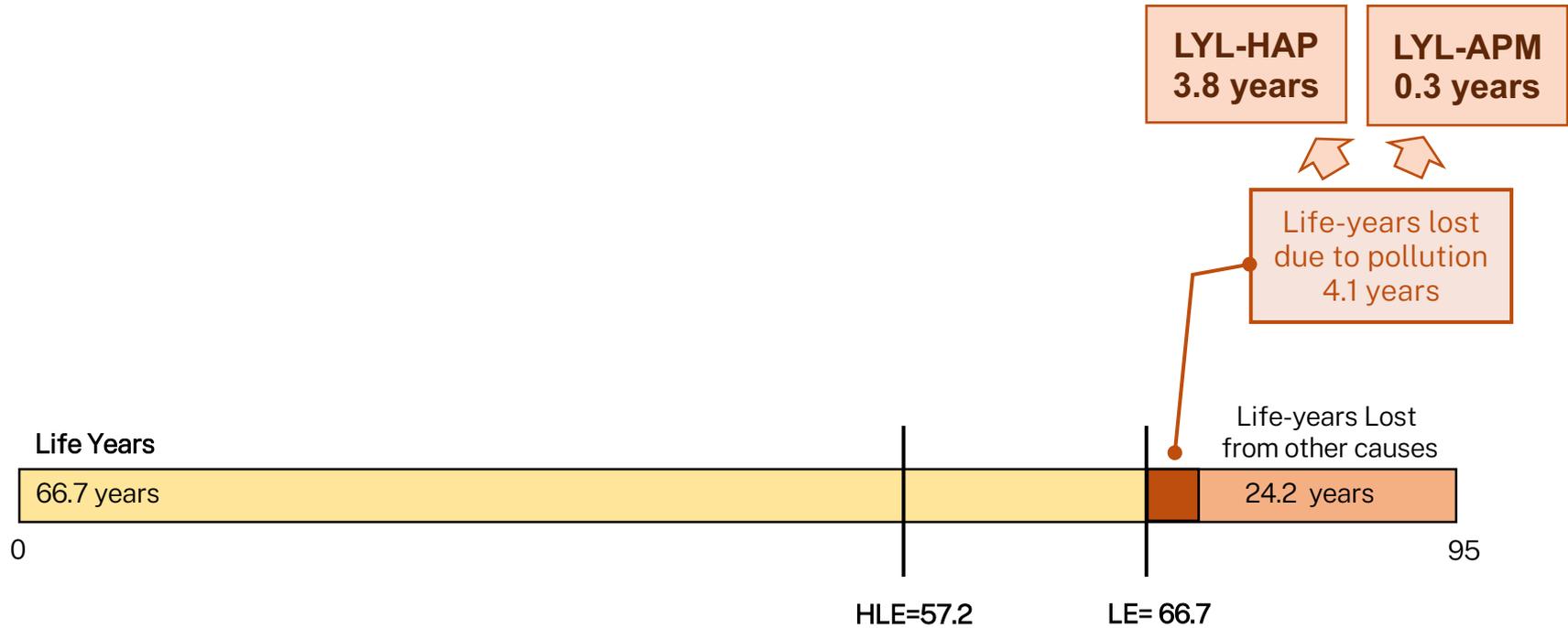
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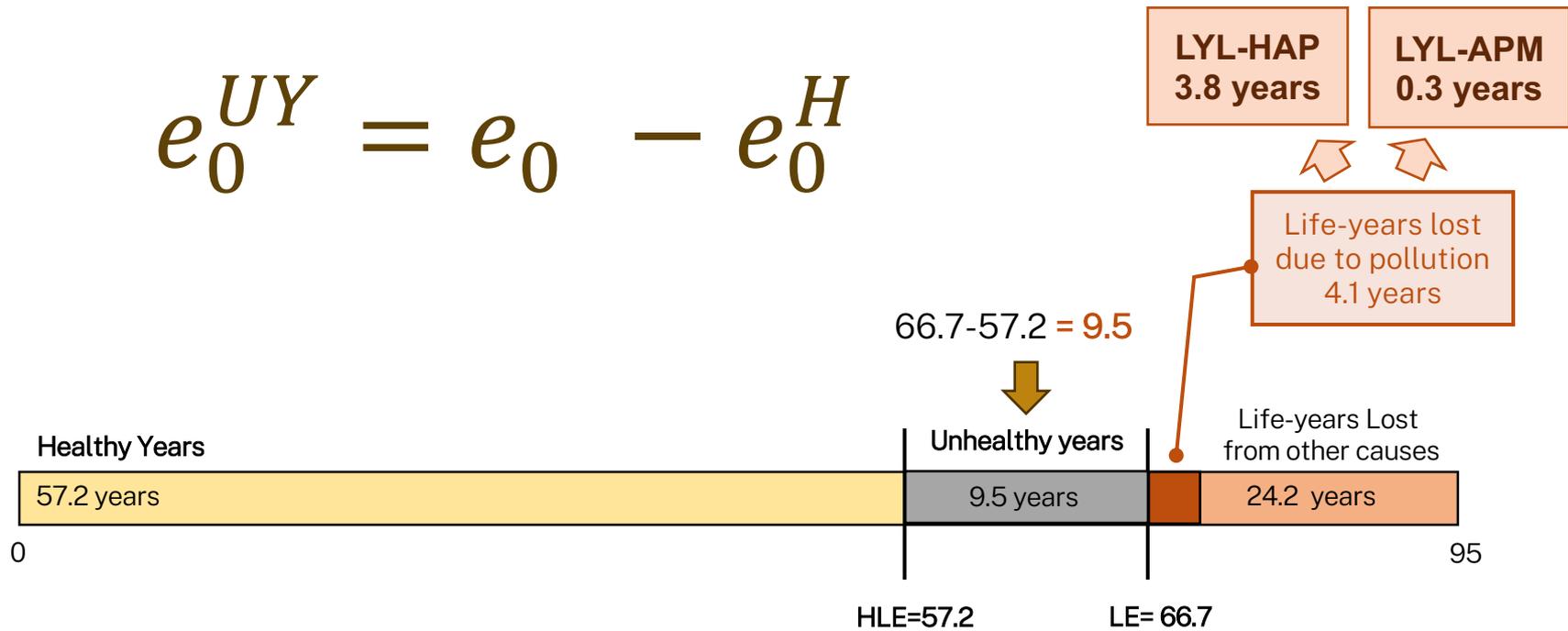


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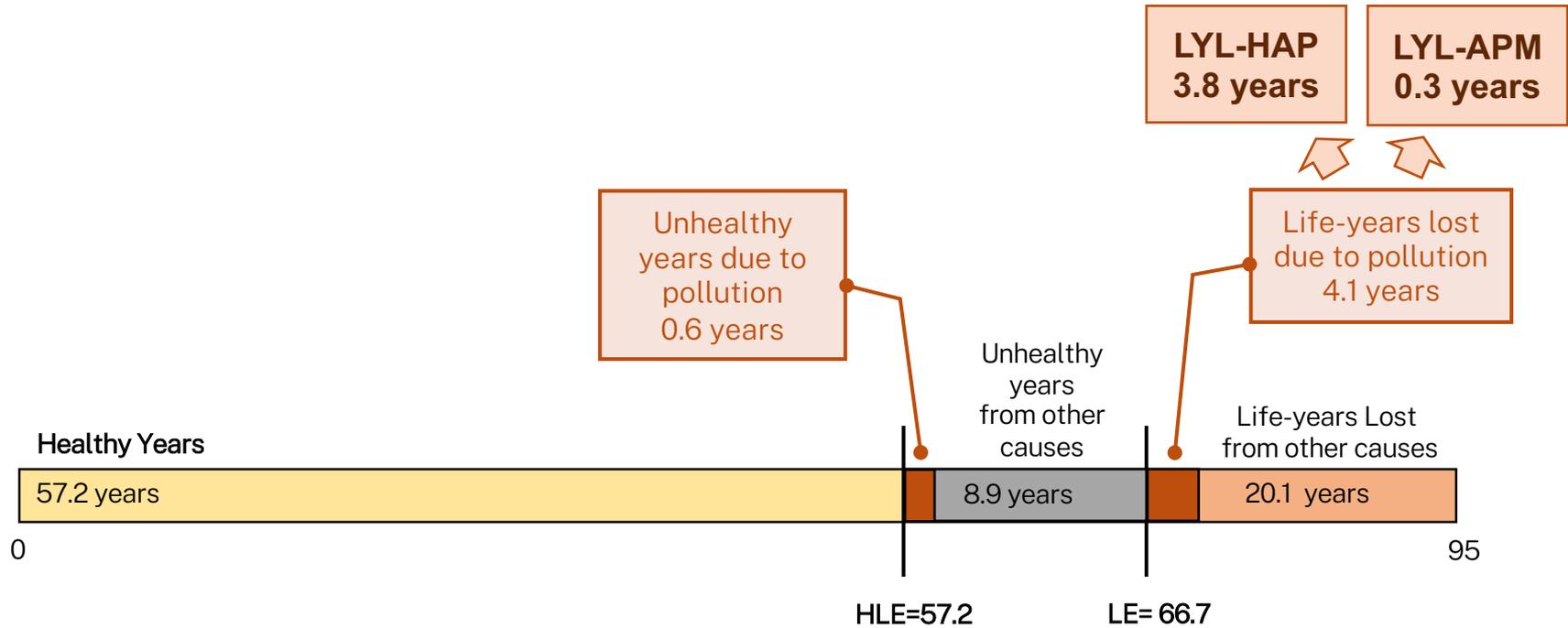


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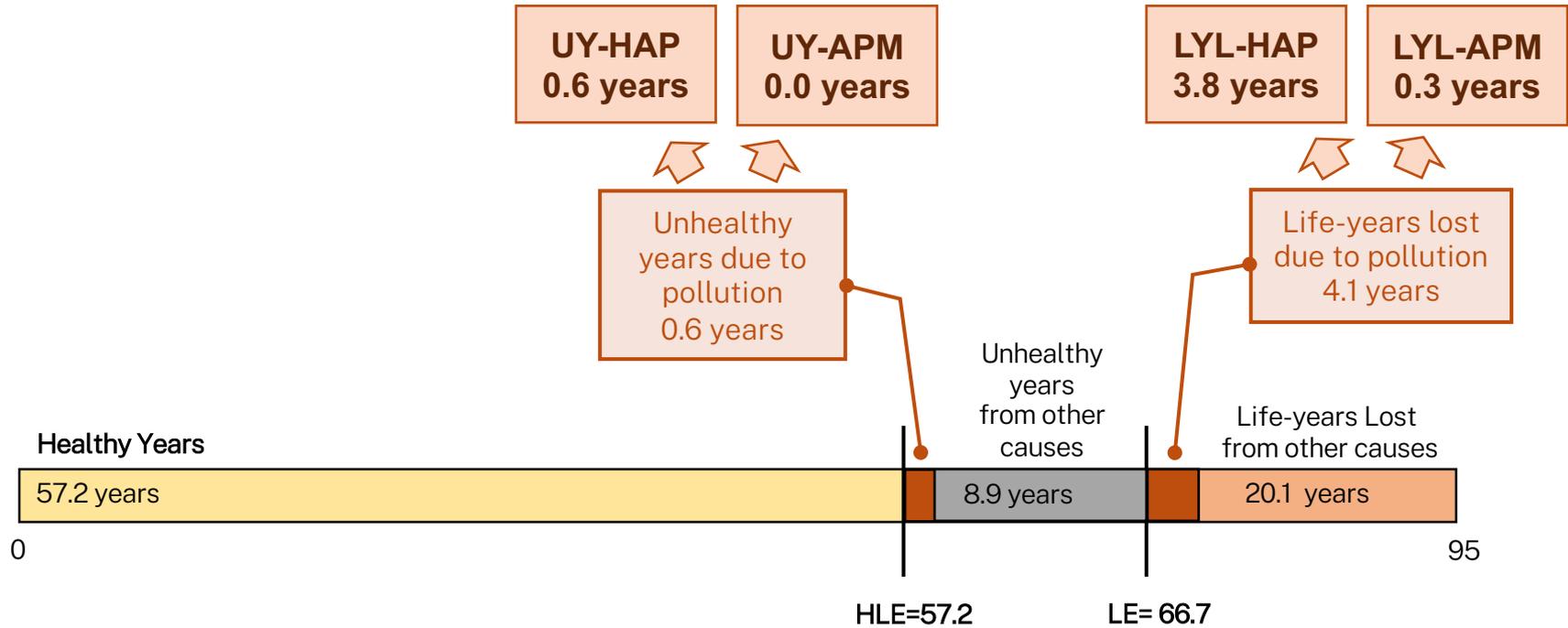
$$e_0^{UY} = e_0 - e_0^H$$



# METHODOLOGY



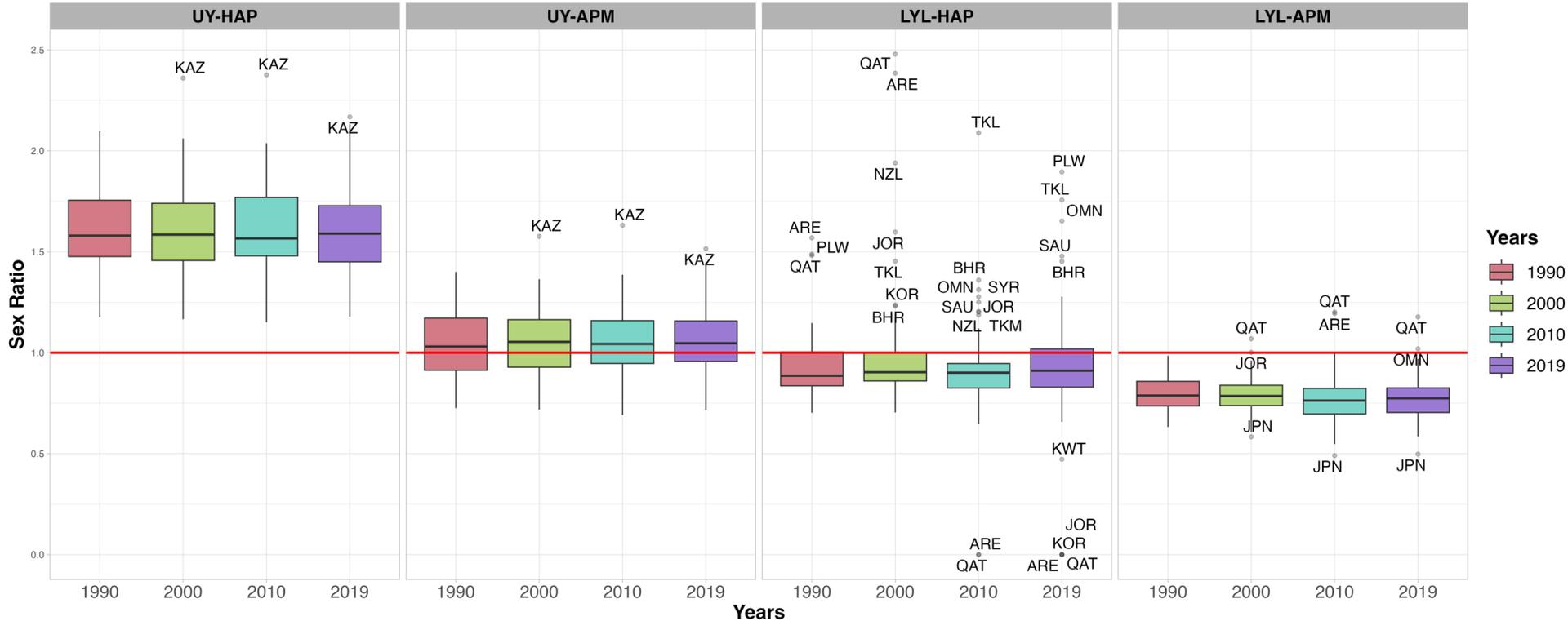
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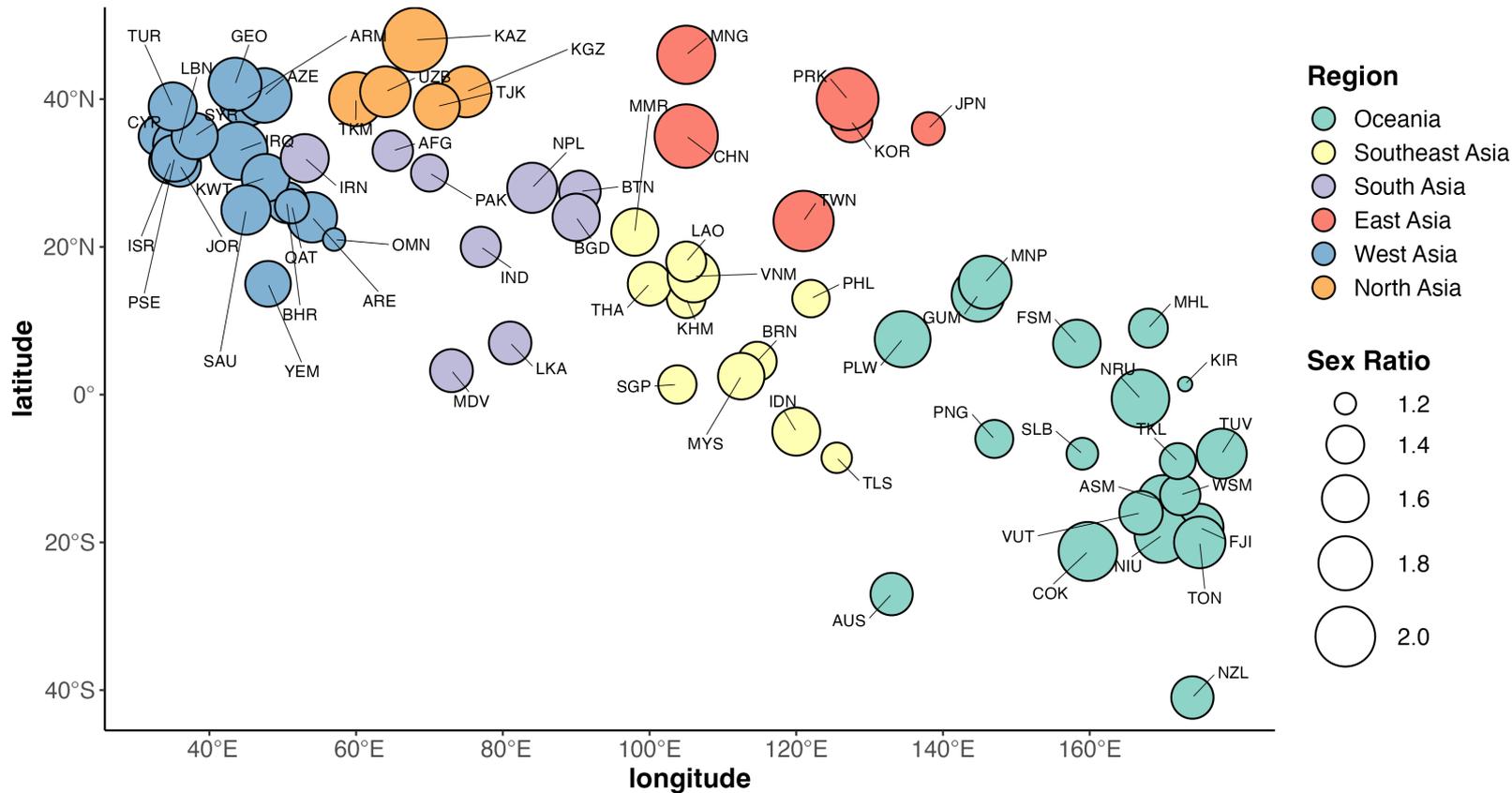
# Sex ratios of UY and LYL caused by air particulate matter



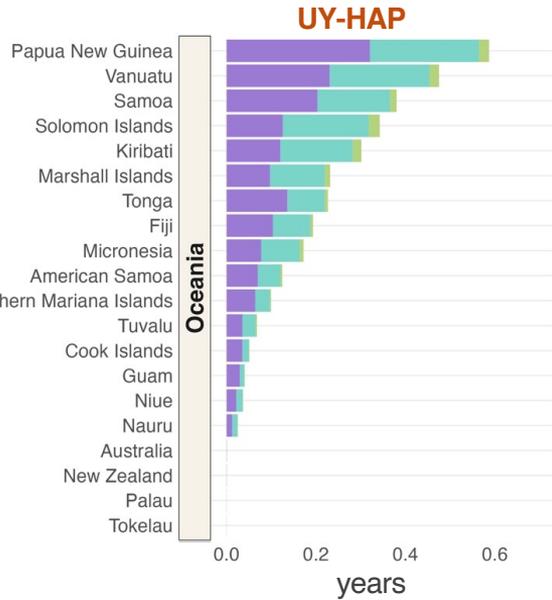
# Sex ratios of UY and LYL caused by air particulate matter



# Sex ratios of UY due to HAP in 2019

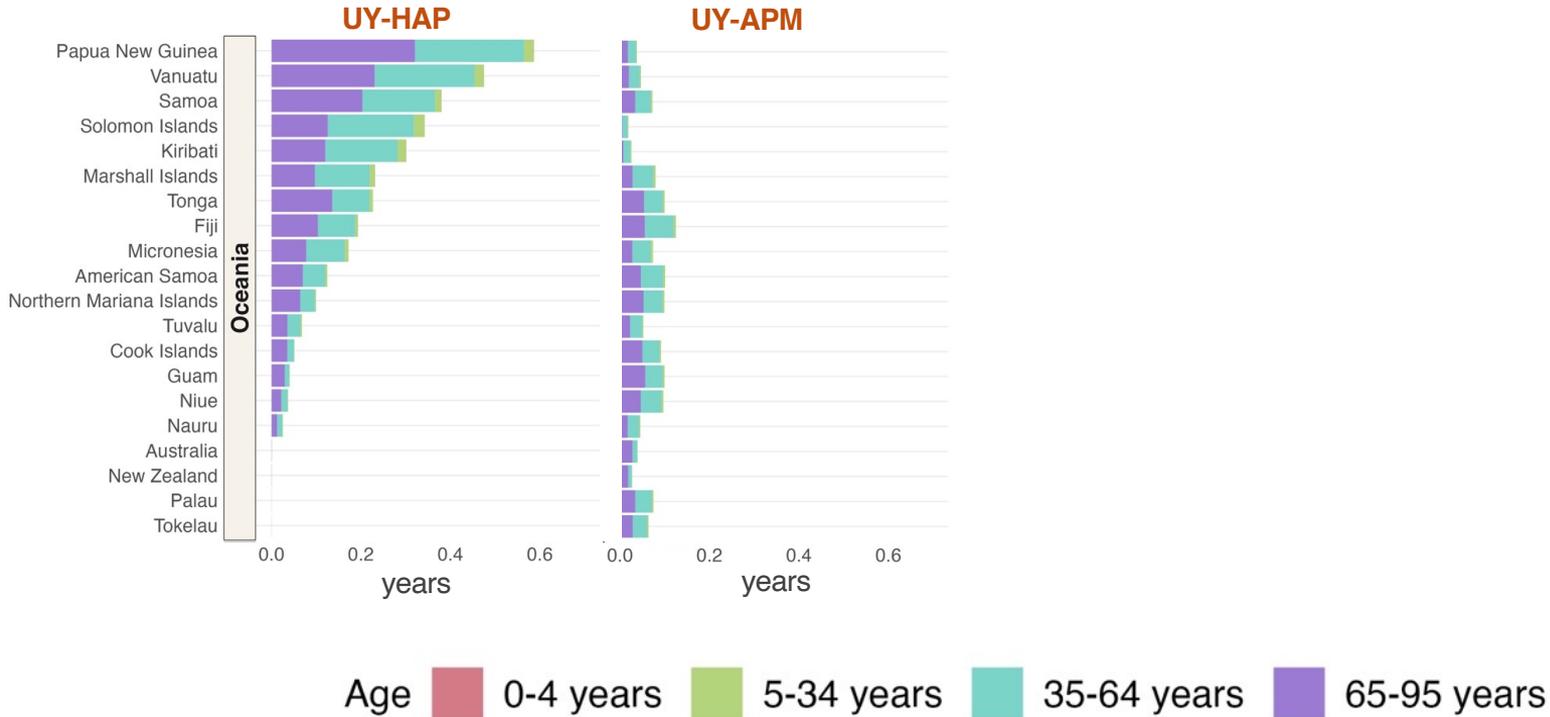


# UY for females in Oceania, by age groups



Age ■ 0-4 years ■ 5-34 years ■ 35-64 years ■ 65-95 years

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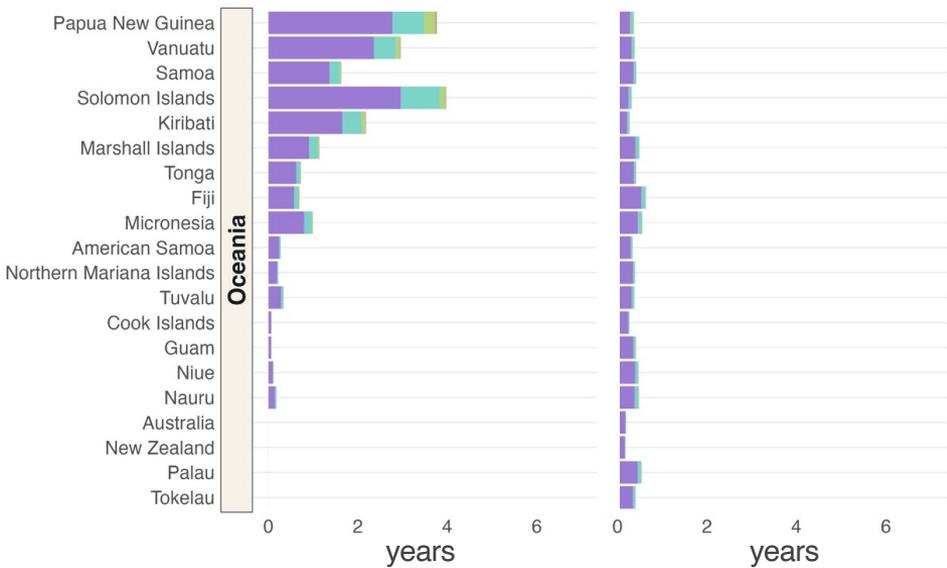
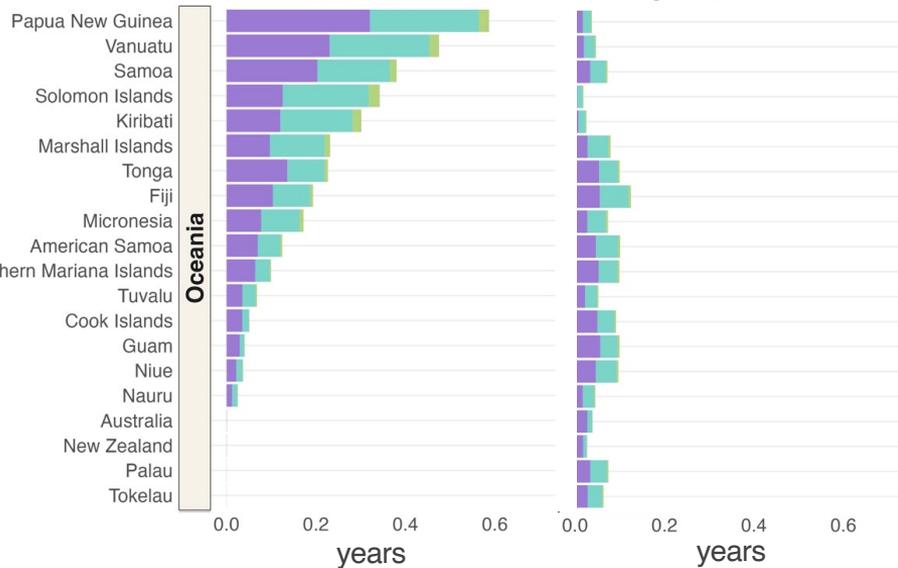
# UY and LYL for females in Oceania, by age groups

UY-HAP

UY-APM

LYL-HAP

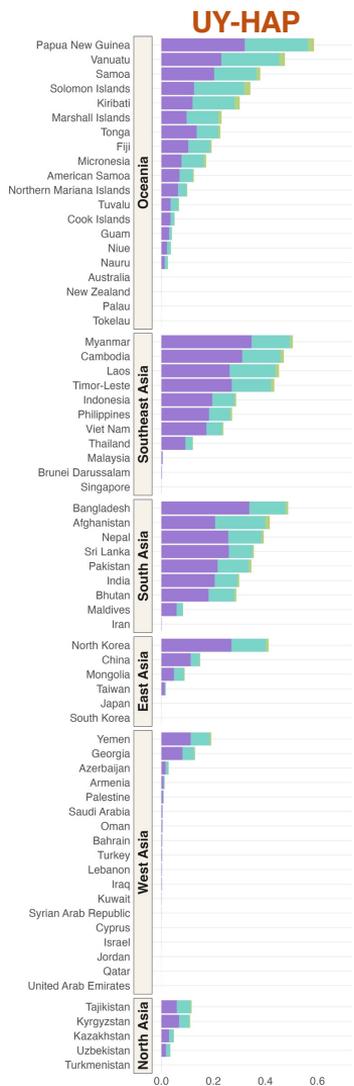
LYL-APM



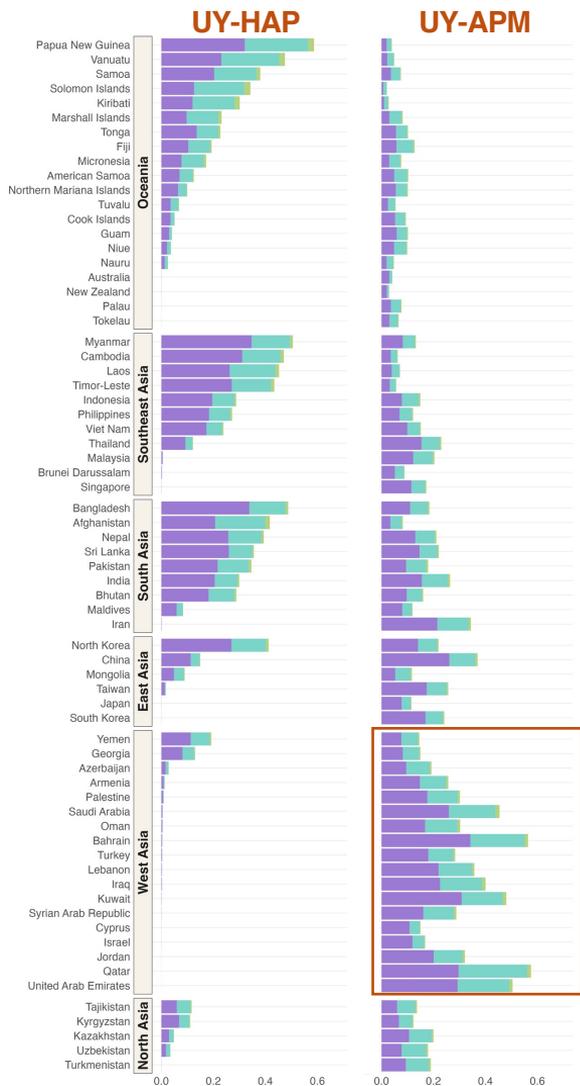
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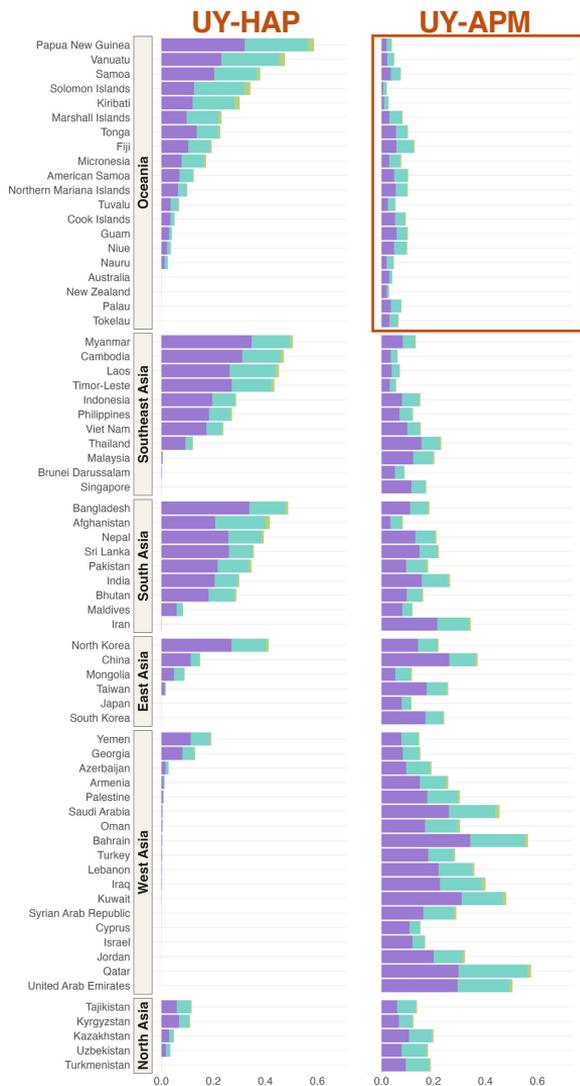
# UY for females by age groups



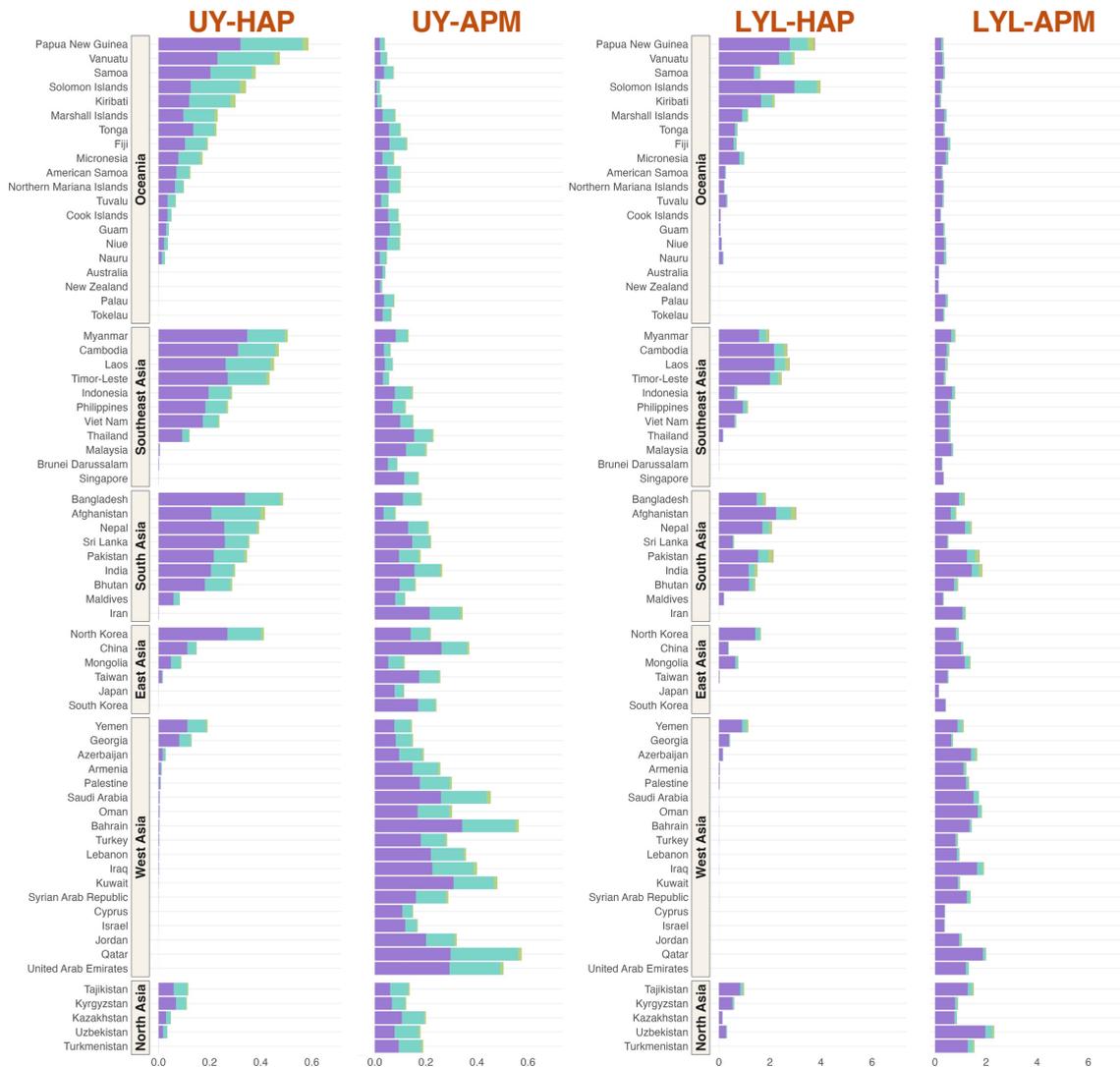
# UY for females by age groups



# UY for females by age groups



# UY and LYL for females by age groups



# CONCLUSION

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- The impact of air pollution mainly seen in the elderly and adults.

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- Females had higher UY, but males had higher LYL.
- Oceania had highest UY and LYL from HAP
- West Asia had higher UY and LYL from APM.
- The impact of air pollution mainly seen in the elderly and adults.
- Policies and interventions are needed for vulnerable populations

# THANK YOU

## Contact Us

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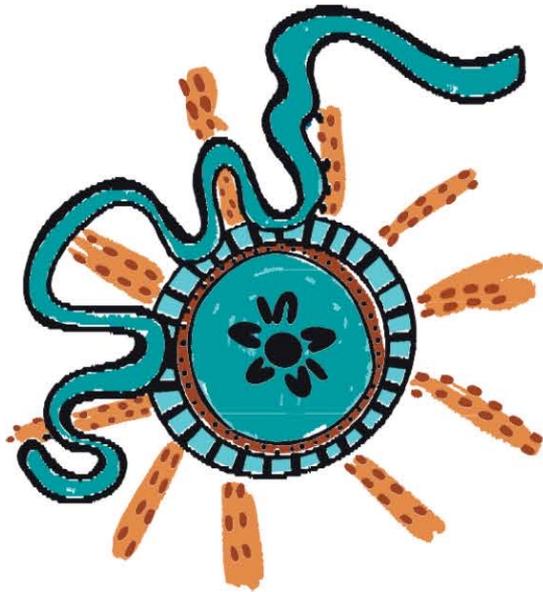


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US IN BRISBANE  
13-18 JULY 2025!



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here for  
more info



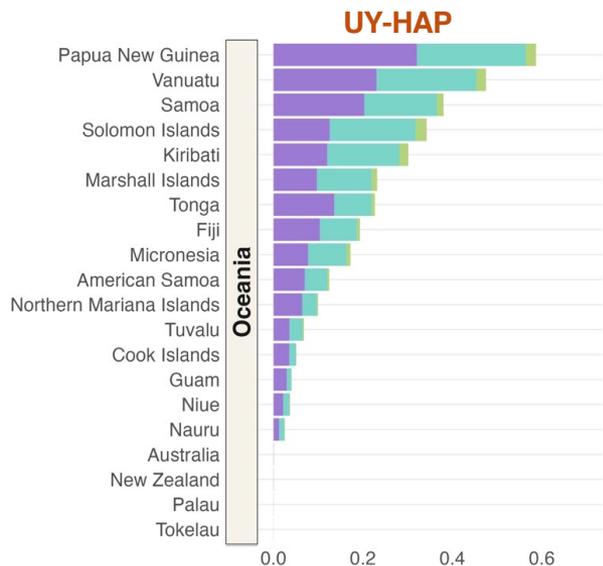
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**POPULATION**  
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13-18 JULY 2025  
BRISBANE CONVENTION  
& EXHIBITION CENTRE  
AUSTRALIA



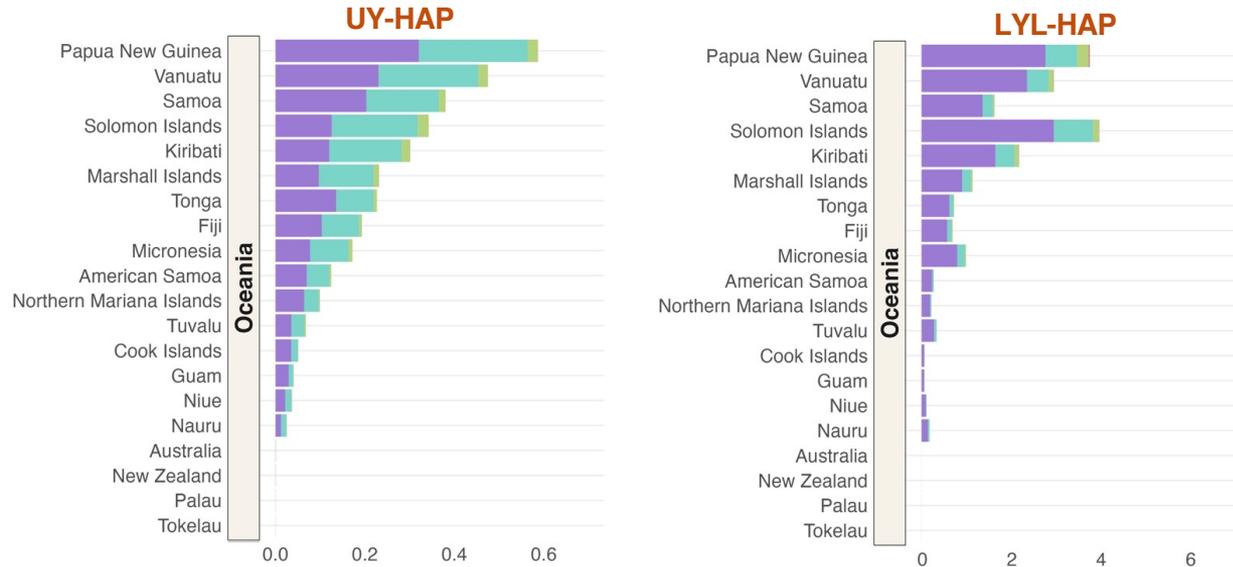
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# Age-specific UY and LYL due to HAP for females in Oceania



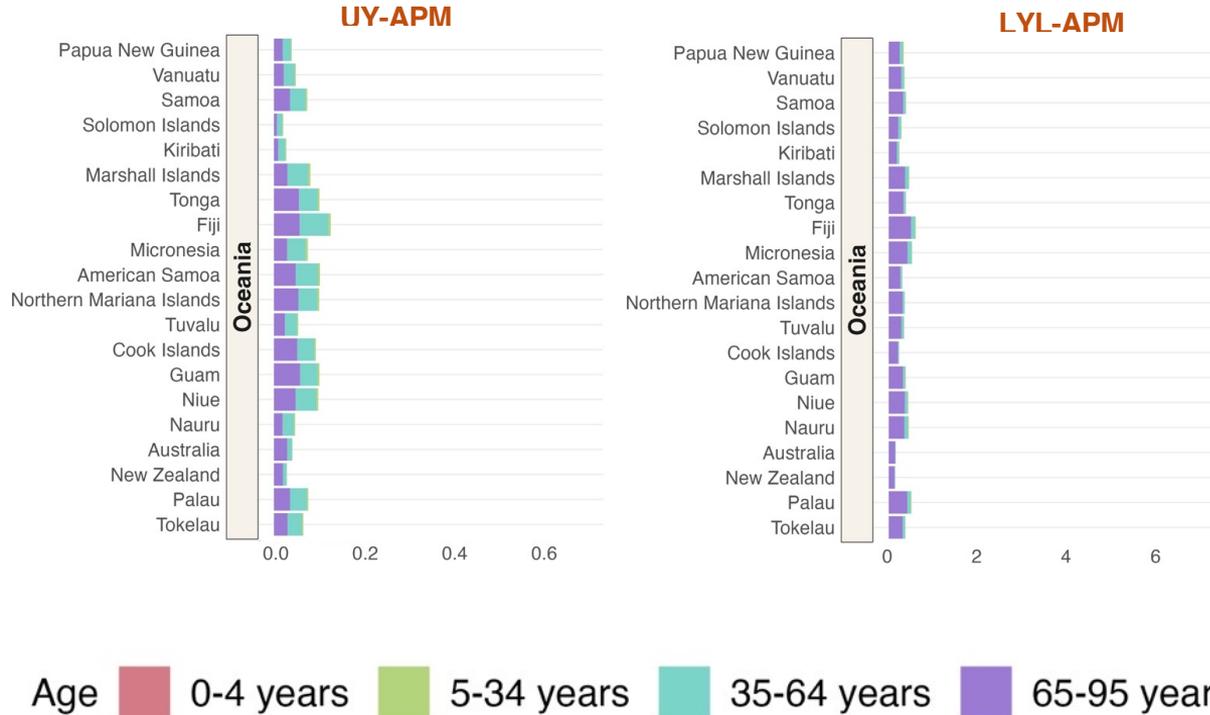
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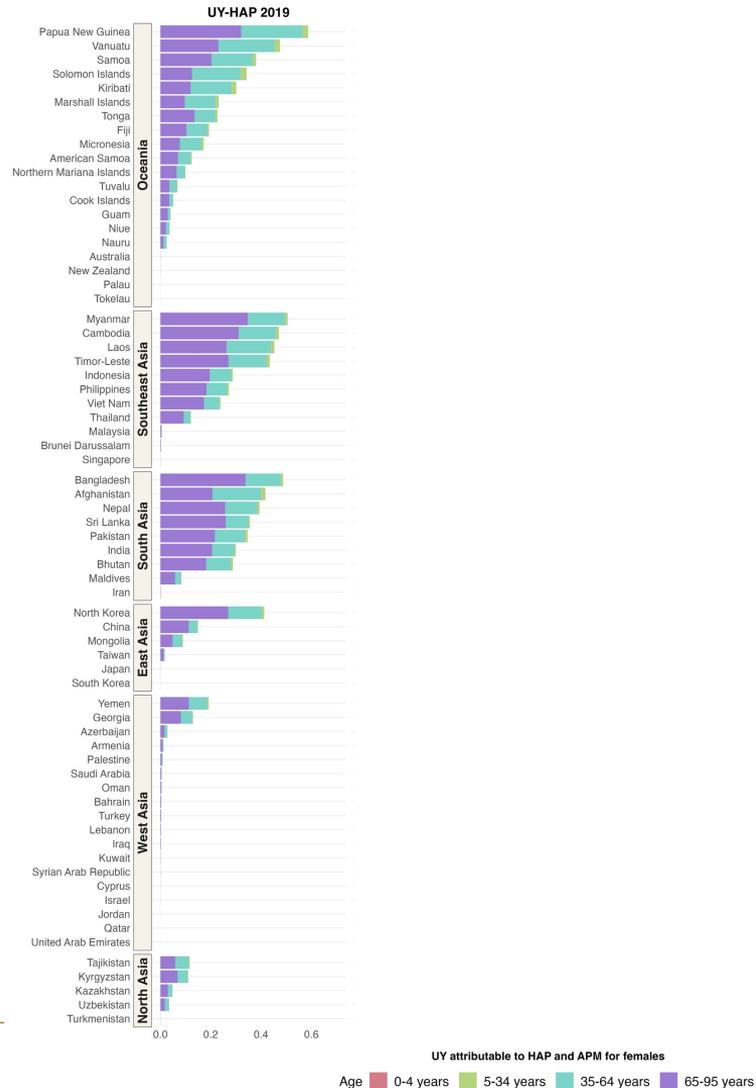


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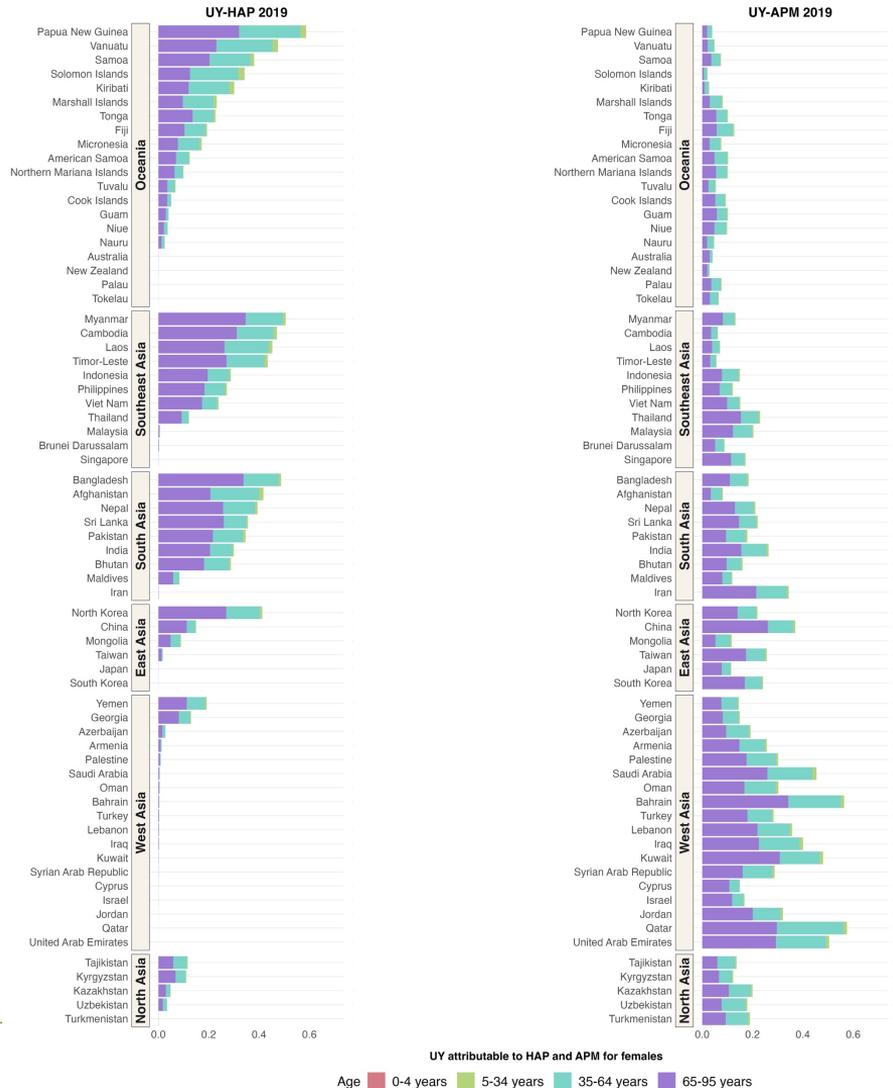
# Age-specific UY and LYL due to APM for females in Oceania



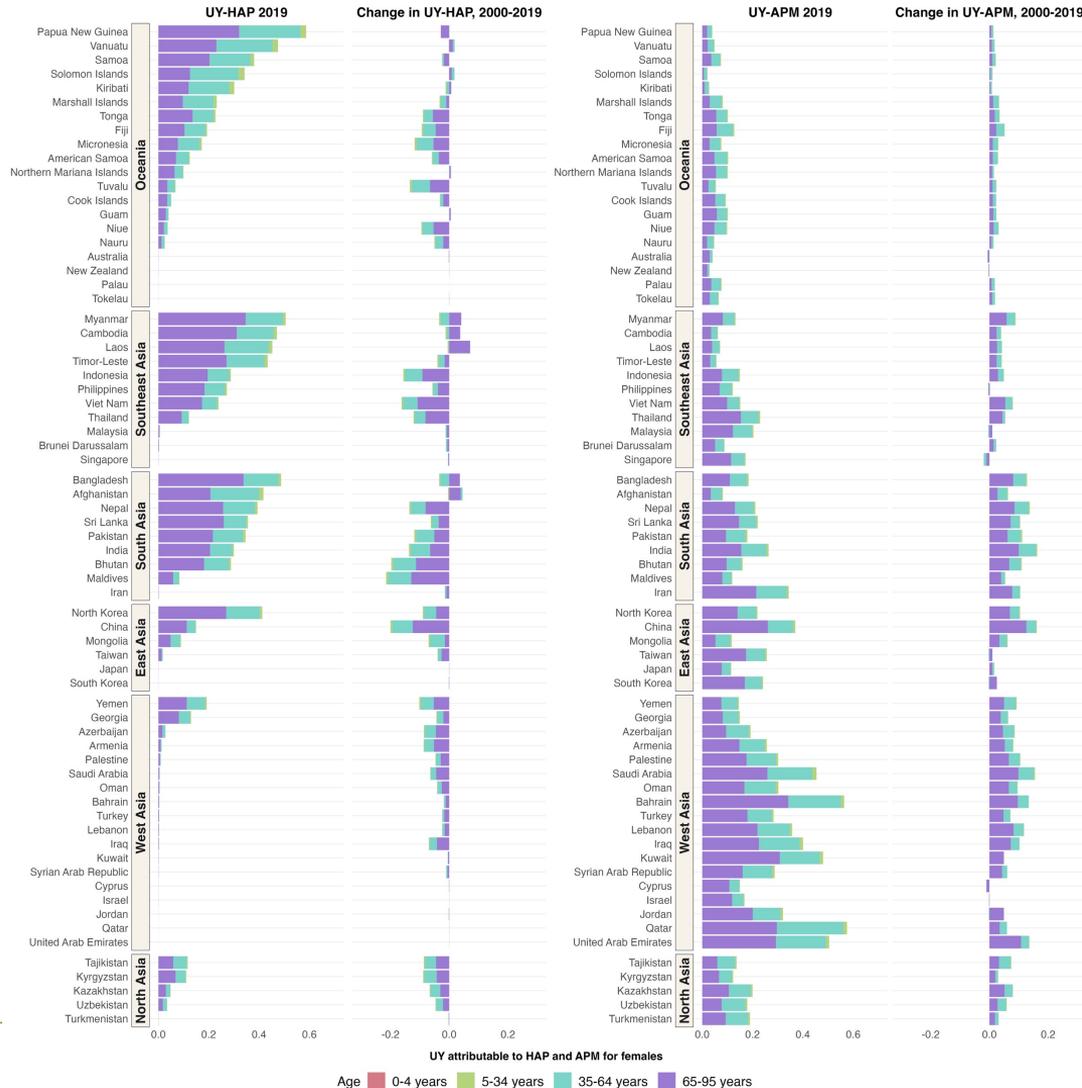
# Age-specific unhealthy years for females



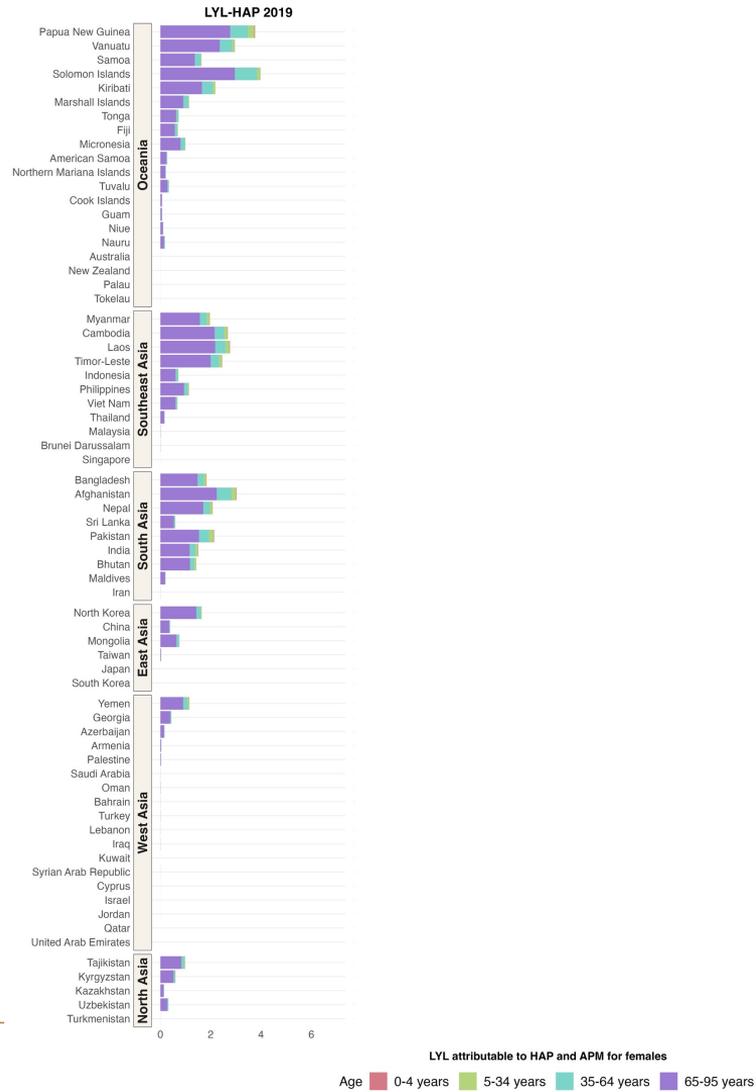
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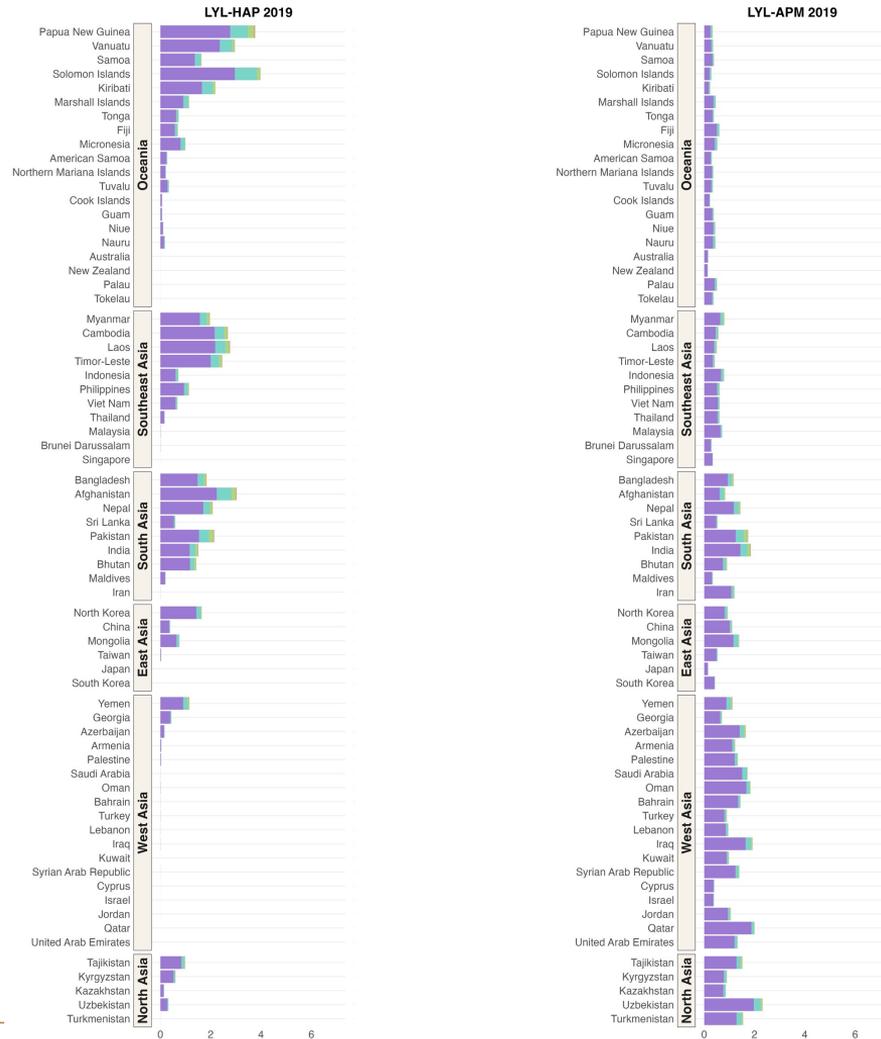
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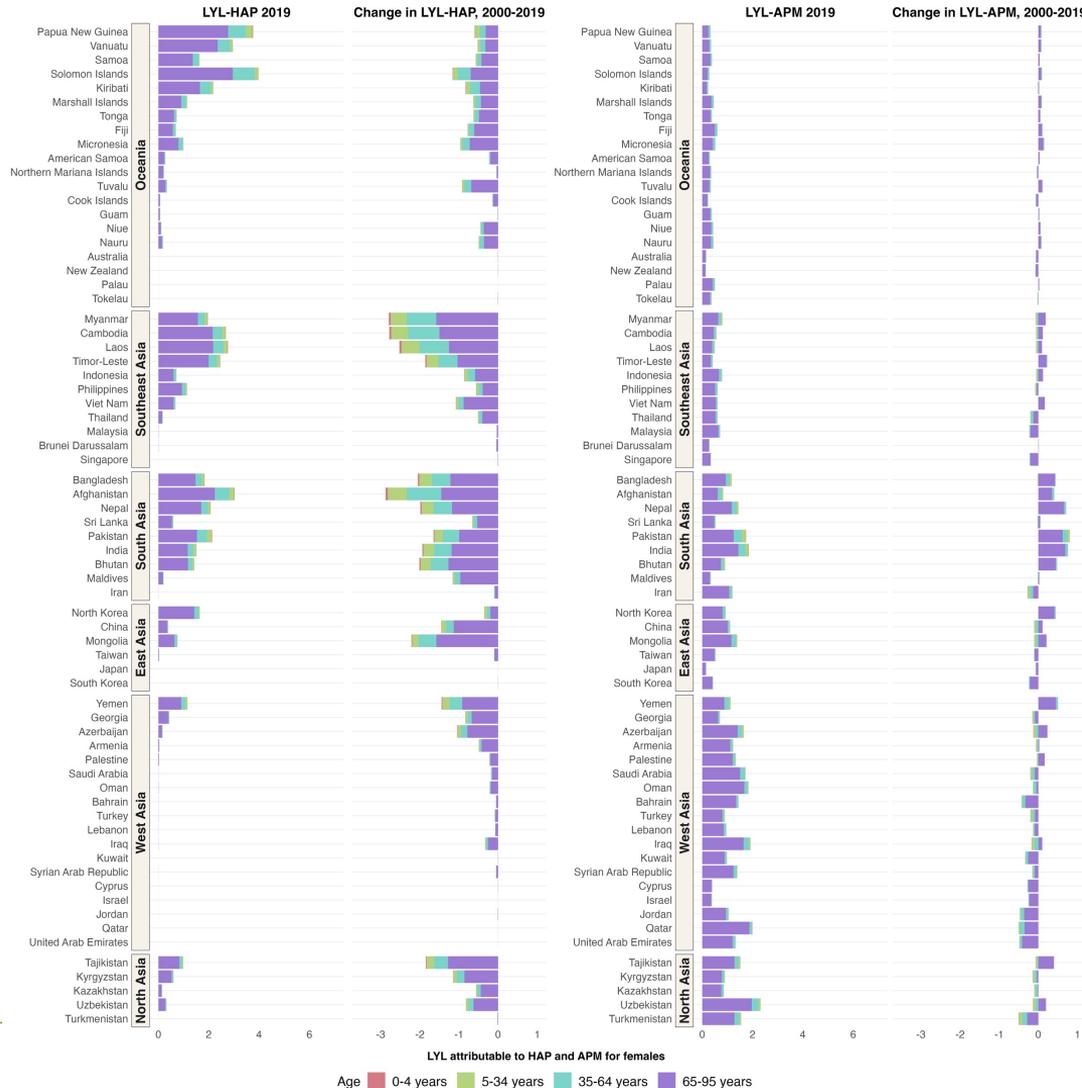
# Age-specific life-years lost for females



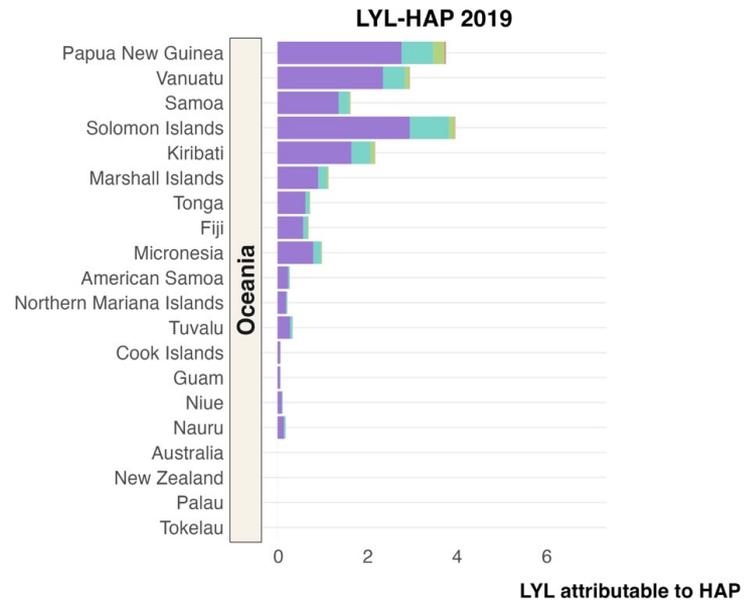
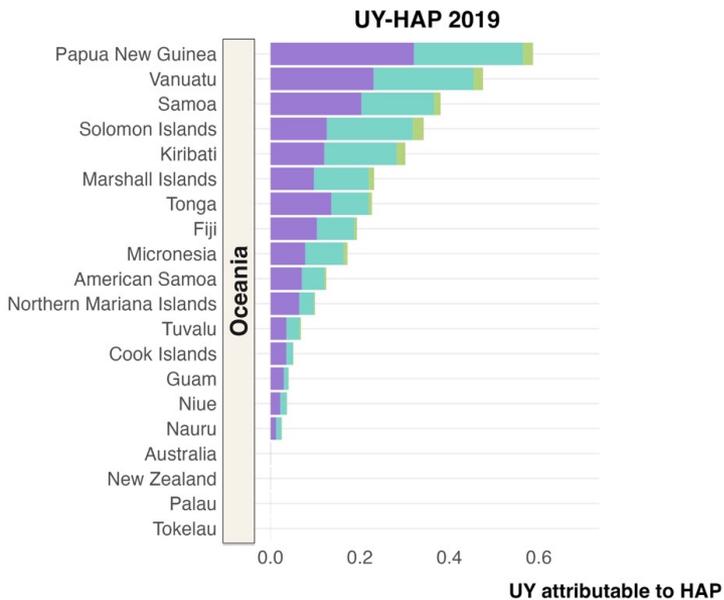
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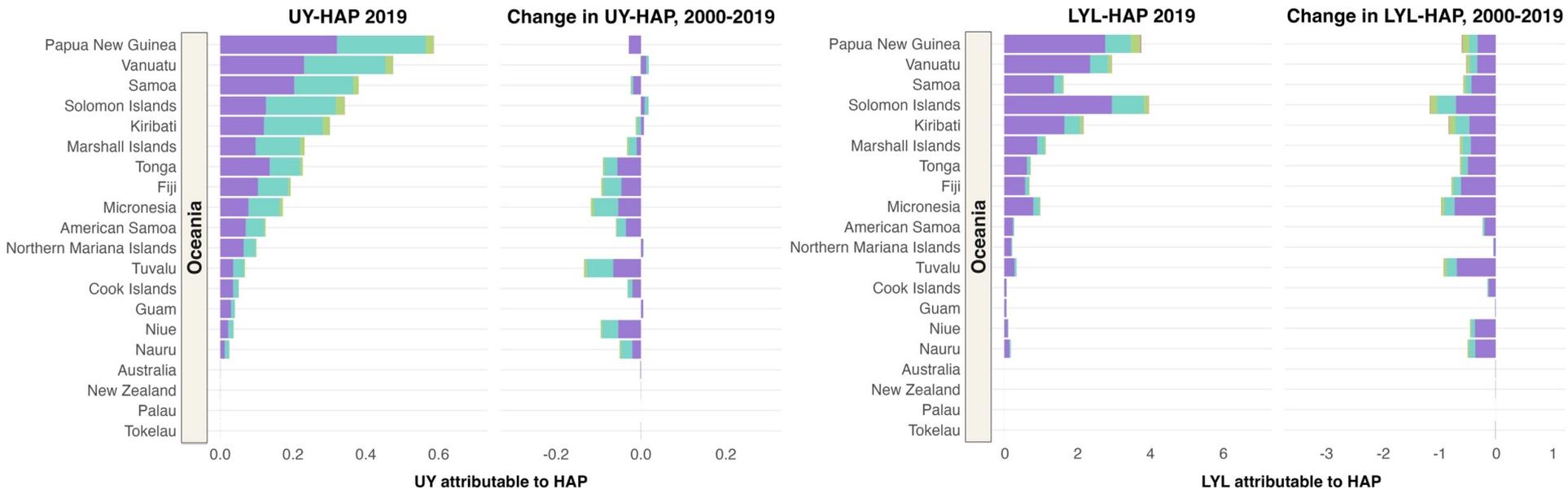
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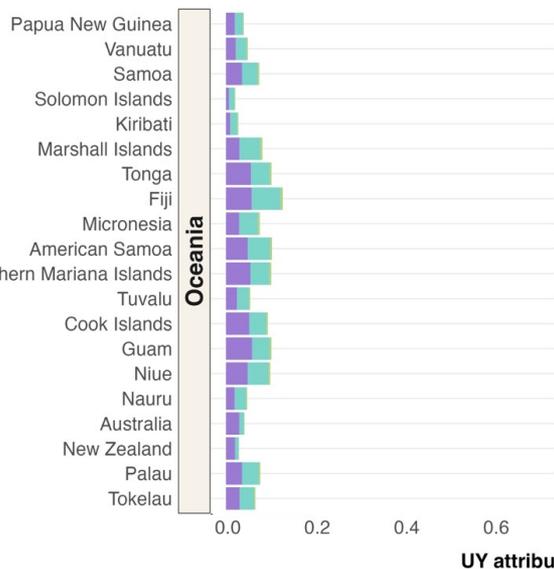


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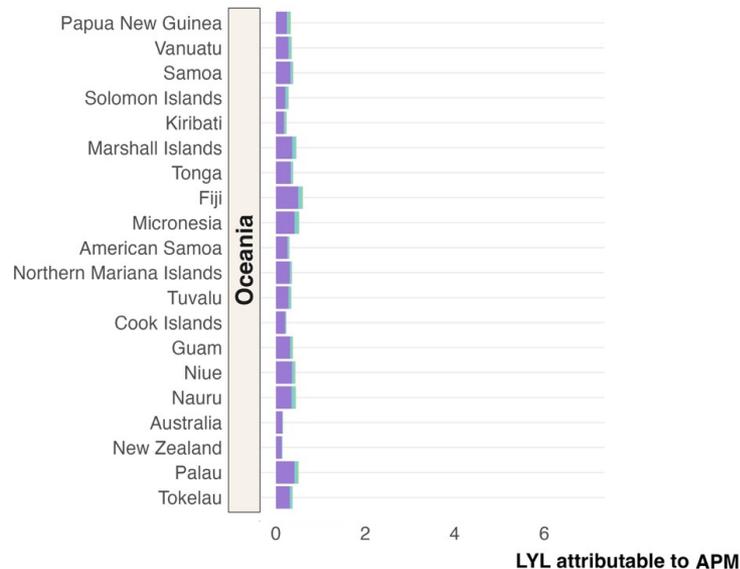


# Age-specific UY and LYL due to APM for females in Oceania

UY-APM 2019

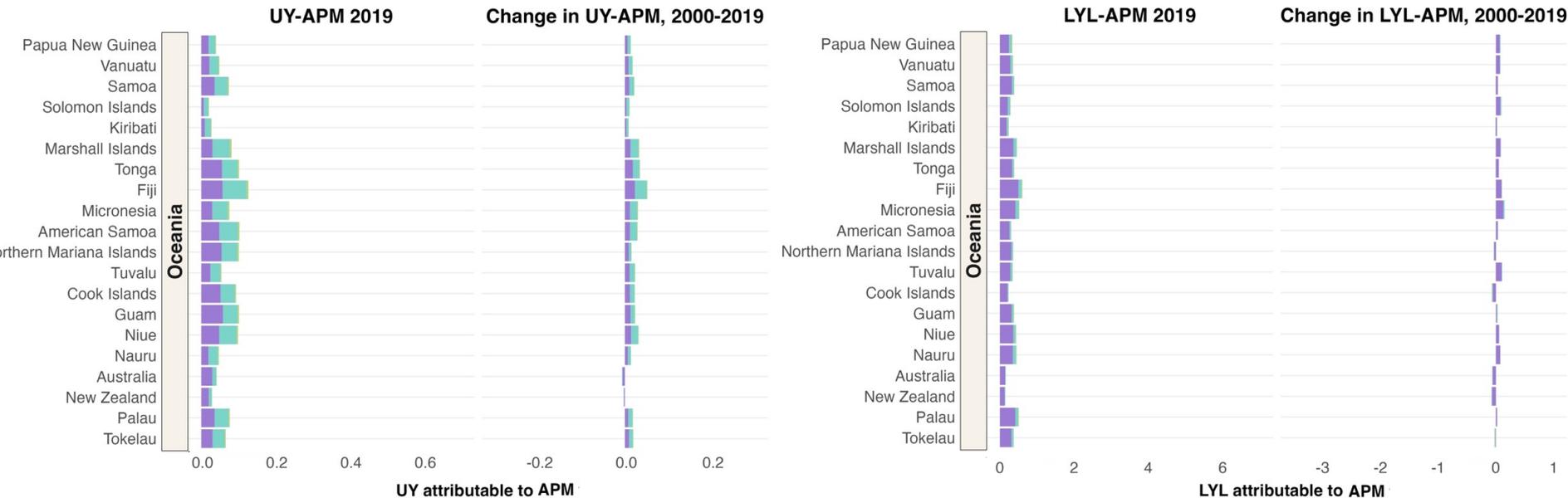


LYL-APM 2019



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