

LUFTFÖRORENINGAR FRÅN SKOGSBRÄNDER – HÄLSOEFFEKTER IDAG OCH MED KLIMATFÖRÄNDRINGAR



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LITE BAKGRUND

- Den globala uppvärmningen väntas öka riskerna för skogsbränder (torka, vindar, blixtar etc)
- Bränderna bidrar totalt till storskaligt högre årsmedelhalter av bl a små partiklar (PM_{2.5}) och orsakar så sjukdom och ökad dödlighet
- Lokalt och under dygn-veckor kan höga halter orsaka akuta hälsoeffekter ffa respiratoriska
- Sverige hade stora bränder 2014 i Västmanland och 2018 bl a i Dalarna, Gästrikland och Jämtland



GLOBALT ÖVER 300 000 DÖDSFALL PER ÅR PGA UTSLÄPPEN

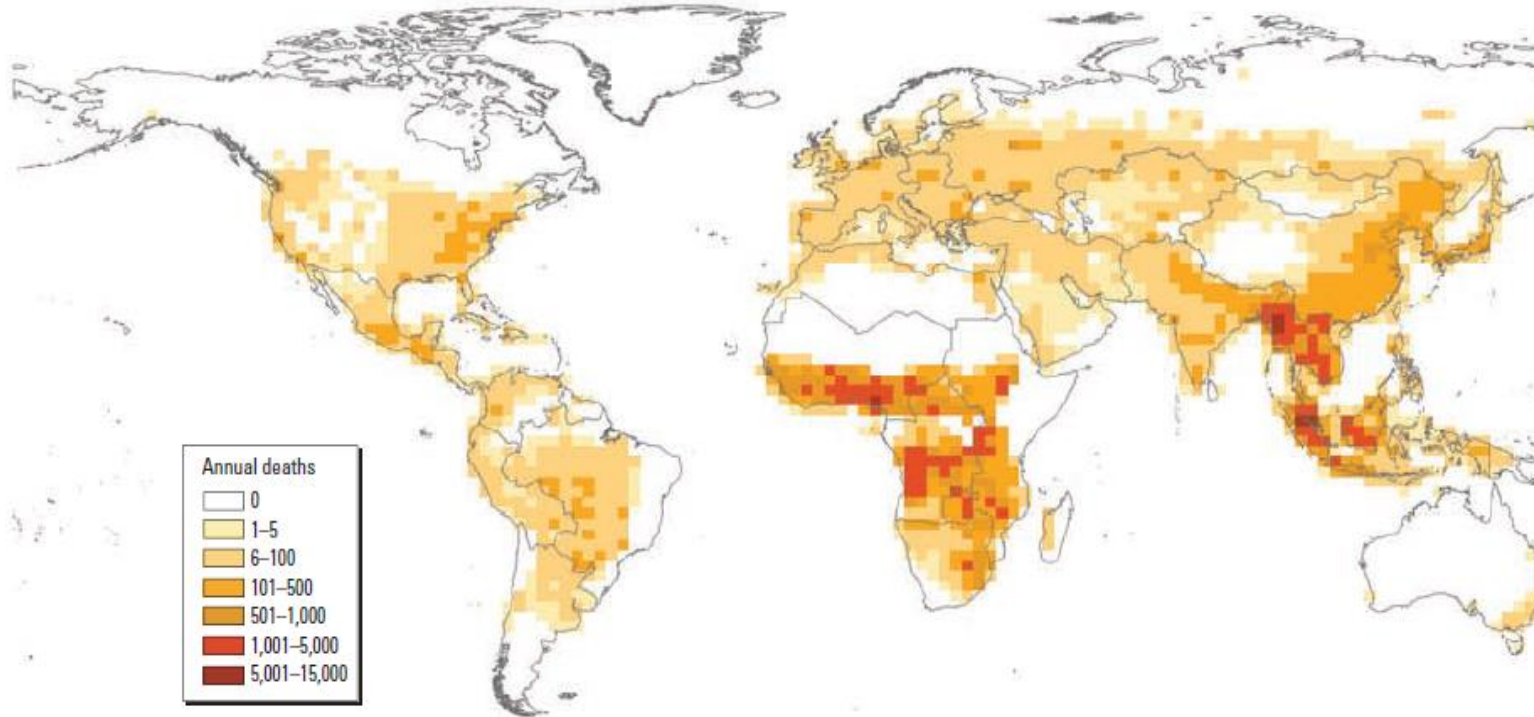


Figure 3. Map showing the principal estimates of the annual average (1997–2006) global mortality attributable to LFS.



PLATSER MED BRÄNDER UNDER EN SEPTEMBERVECKA 2015

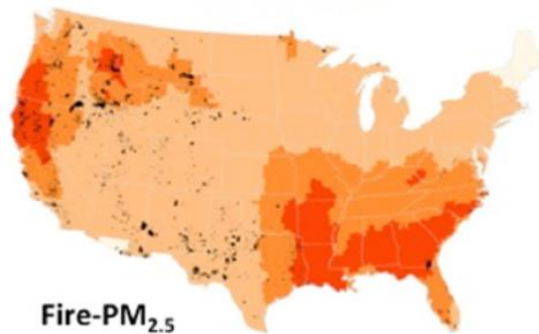


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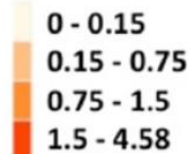
BÅDE LÅNG- OCH KORTTIDSEXPONERIG PÅVERKAS

W.E. Cascio / Science of the Total Environment 624 (2018) 586–595

*Annual average fire-PM_{2.5} footprint for
US counties*

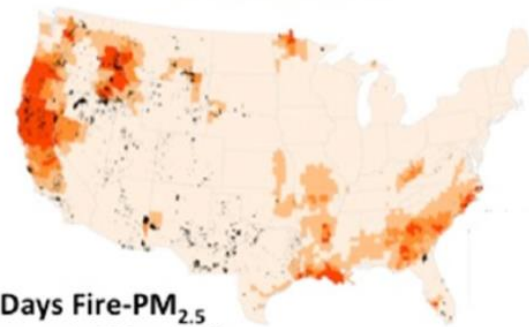


Fire-PM_{2.5}
μg/m³

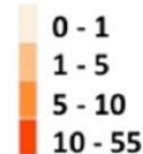


*Health Protective PM_{2.5} Standard
Annual PM_{2.5} NAAQS: 12 μg/m³*

*Number of days fire-PM_{2.5} exceeds the
daily NAAQS*



Days Fire-PM_{2.5}
exceeds 35 μg/m³



*Health Protective PM_{2.5} Standard
24-hour average PM_{2.5}: 35 μg/m³*



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RÖKPLYMEN KAN GE HÖGA HALTER PÅ >10 MILS AVSTÅND



STUDIE AV HUR FINLAND PÅVERKAS VID EPISOD FRÅN SYDOST

Population exposure to fine particles and estimated excess mortality in Finland from an East European wildfire episode

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Long-range transported particulate matter (PM) air pollution episodes associated with wildfires in the Eastern Europe are relatively common in Southern and Southeastern Finland. In severe cases such as in August–September 2002, the reduced visibility and smell of the smoke, and symptoms such as irritation of eyes and airways experienced by the population raise the issue into the headlines. Because PM air pollution, in general, has been identified as a major health risk, and the exposures are of repeating nature, the issue warrants a risk assessment to estimate the magnitude of the problem. The current work uses the available air quality data in Finland to estimate population exposures caused by one of the worst episodes experienced in this decade. This episode originated from wildfires in Russia, Belarus, Ukraine, and the Baltic countries. The populations of 11 Southern Finnish provinces were exposed between 26 August and 8 September 2002, for 2 weeks to an additional population-weighted average PM_{2.5} level of 15.7 µg/m³. Assuming similar effect on mortality for these particles as observed in epidemiological time series studies on urban particles (0.5%–2% increase in mortality per 10 µg/m³, central estimate 1%), this exposure level would be associated with 9–34 cases (17 cases central estimate) of additional mortality. Epidemiological evidence specific



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SVERIGE MED I MODELLERING OCH BERÄKNING AV KORTTIDSEFFEKTER PÅ MORTALITET

Mortality risk attributable to wildfire-related PM_{2.5} pollution: a global time series study in 749 locations



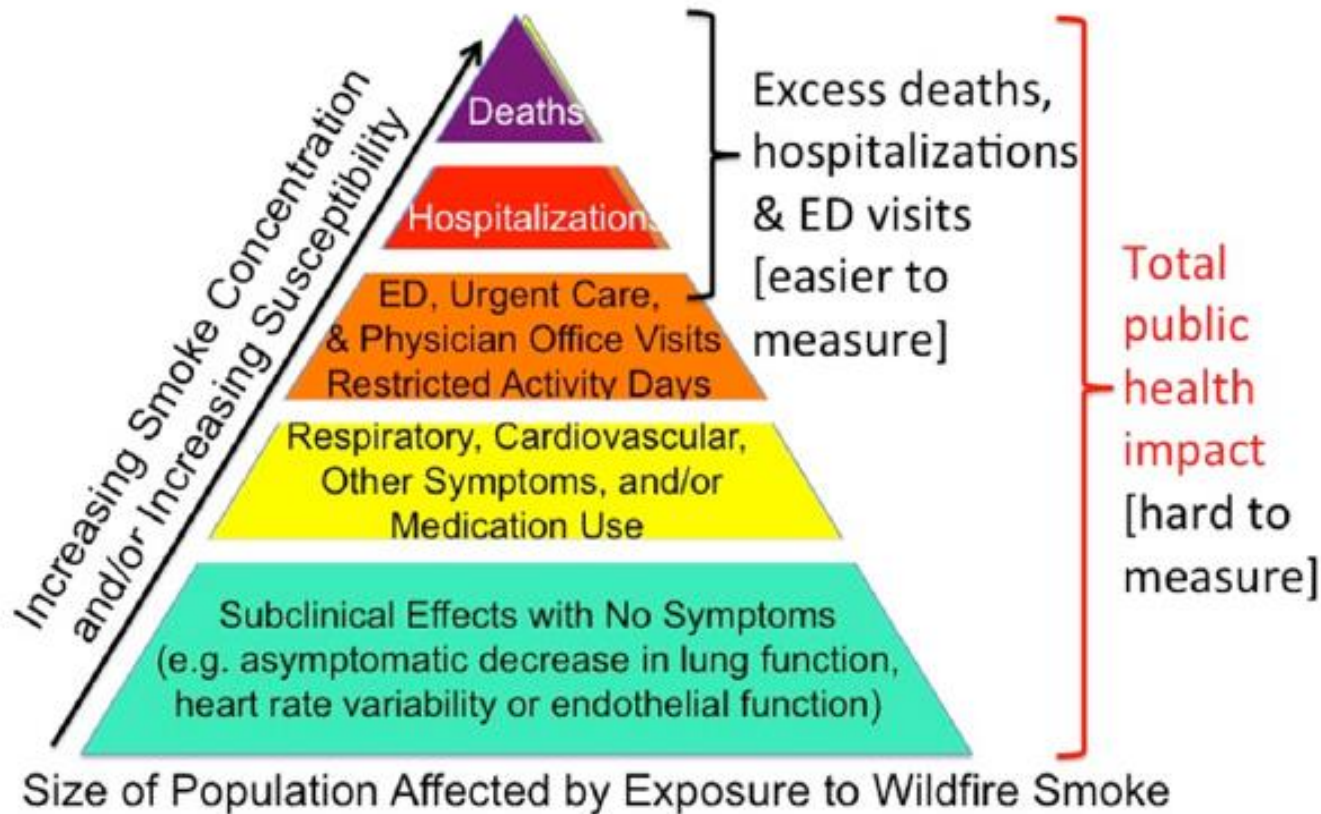
Gongbo Chen, Yuming Guo, Xu Yue, Shilu Tong, Antonio Gasparrini, Michelle L Bell, Ben Armstrong, Joel Schwartz, Jouni J K Jaakkola, Antonella Zanobetti, Eric Lavigne, Paulo Hilario Nascimento Saldiva, Haidong Kan, Dominic Royé, Ai Milojevic, Ala Overcenco, Aleš Urban, Alexandra Schneider, Alireza Entezari, Ana Maria Vicedo-Cabrera, Ariana Zeka, Aurelio Tobias, Baltazar Nunes, Barrak Alahmad, Bertil Forsberg, Shih-Chun Pan, Carmen Íñiguez, Caroline Ameling, César De la Cruz Valencia, Christofer Åström, Danny Houthuijs, Do Van Dung, Evangelia Samoli, Fatemeh Mayvaneh, Francesco Sera, Gabriel Carrasco-Escobar, Yadong Lei, Hans Orru, Ho Kim, Iulian-Horia Holobaca, Jan Kyselý, João Paulo Teixeira, Joana Madureira, Klea Katsouyanni, Magali Hurtado-Díaz, Marek Maasikmets, Martina S Ragettli, Masahiro Hashizume, Massimo Stafoggia, Mathilde Pascal, Matteo Scortichini, Micheline de Sousa Zanotti Stagliorio Coêlho, Nicolás Valdés Ortega, Niilo R I Ryt, Noah Scovronick, Patricia Matus, Patrick Goodman, Rebecca M Garland, Rosana Abrutzky, Samuel Osorio Garcia, Shilpa Rao, Simona Fratianni, Tran Ngoc Dang, Valentina Colistro, Veronika Huber, Whanhee Lee, Xerxes Seposo, Yasushi Honda, Yue Leon Guo, Tingting Ye, Wenhua Yu, Michael J Abramson, Jonathan M Samet, Shanshan Li

Summary

Background Many regions of the world are now facing more frequent and unprecedentedly large wildfires. However, the association between wildfire-related PM_{2.5} and mortality has not been well characterised. We aimed to

Lancet Planet Health 2021;
5: e579-87

VÅRD FÖR AKUTA ANDNINGS- PROBLEM TYDLIGASTE EFFEKTEN



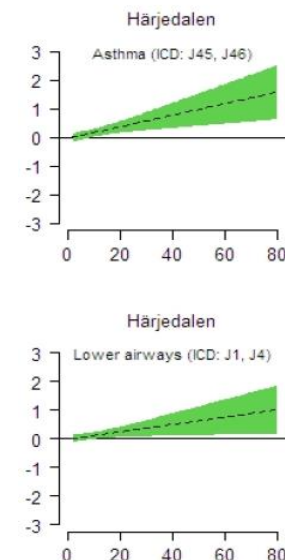
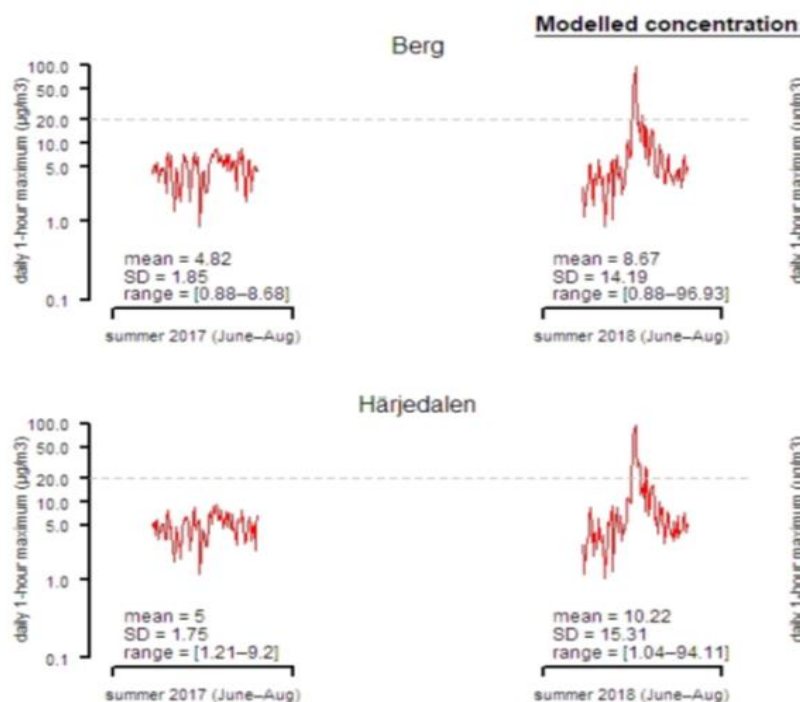


Article

Respiratory Health Effects of Wildfire Smoke during Summer of 2018 in the Jämtland Härjedalen Region, Sweden

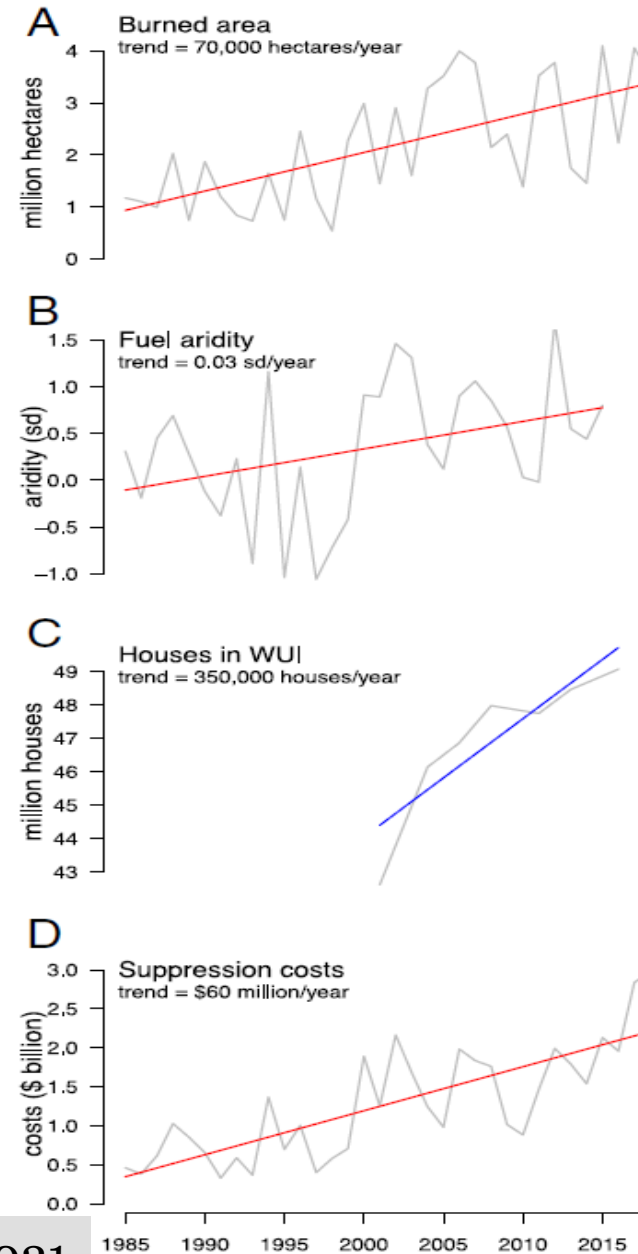
Andreas Tornevi ^{1,*}, Camilla Andersson ², Ana Cristina Carvalho ², Joakim Langner ², Nikolai Stenfors ³ and Bertil Forsberg ¹

Int. J. Environ. Res. Public Health **2021**, *18*, 6987



Sammanvägt för 8 kommuner gav brandröksdagar 68% fler akutbesök för astma under 3–12 dagar/kommun

TRENDER I USA 1985-2018



Burke et al, 2021

Estimating PM_{2.5}-related premature mortality and morbidity associated with future wildfire emissions in the western US

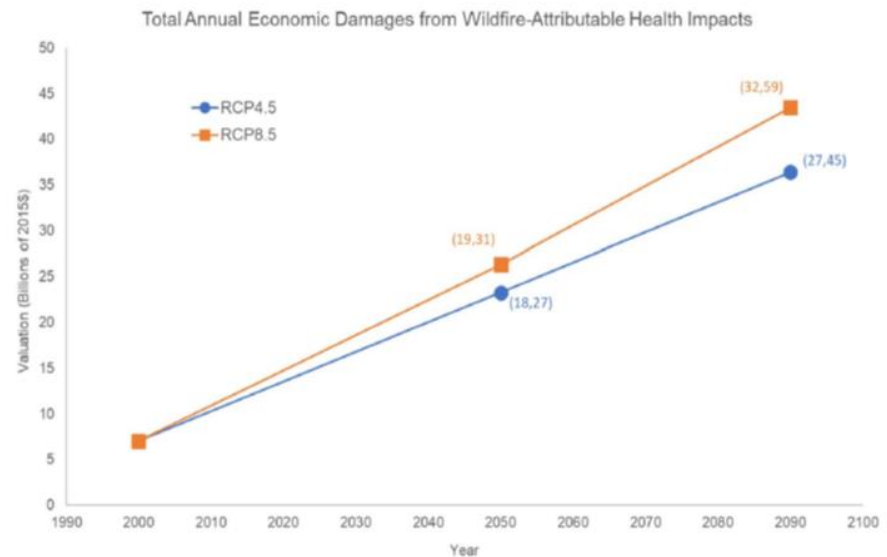
James E Neumann¹, Meredith Amend¹, Susan Anenberg², Patrick L Kinney³, Marcus Sarofim⁴, Jeremy Martinich⁴, Julia Lukens¹, Jun-Wei Xu⁵, Henry Roman¹

- Analyserar hur framtida emissioner påverkas av klimatet, främst variabilitet i nederbörd
- Två emissionsscenarier (RCP4.5 resp RCP8.5)
- Klimatprojektioner från 5 modeller nedskalade
- Baseline 1996-2005, 2046-2055, 2086-2095
- Befolkningsprognoser mm



STORA KONSEKVENSER VÄNTAS

- Klimatförändringarna beräknas öka emissionerna av PM2.5 med 0,4 resp 0,7 % per år
- Med det högre utsläppsscenariot ökar antalet orsakade dödsfall 3,5 gånger, där klimat står för 60% av ökningen
- Hälsokostnaderna ökar kraftigt



SVERIGE BORDE HA MOBILA MÄTMÖJLIGHETER OCH VARNINGSSYSTEM

Air Quality Guide for Pollution from Wildfire Smoke							
AQI Category	Air Quality Index (AQI)	PM _{2.5} Concentration (µg/m ³) ¹ 1-3 hr. avg.	PM _{2.5} Concentration (µg/m ³) ¹ 8 hr. avg.	PM _{2.5} Concentration (µg/m ³) 24 hr. avg.	Visibility ² (miles)	Health Effects Statement	Cautionary Statement
Good	0 – 50	0-38	0-22	0-15	10+		None
Moderate	51 – 100	39-88	23-50	16-35	6-10		Unusually sensitive people should consider reducing prolonged or heavy exertion
Unhealthy for Sensitive Groups	101-150	89-138	51-79	36-65	3-5	Increasing likelihood of respiratory symptoms in sensitive individuals, aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly.	People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.
Unhealthy	151-200	139-351	80-200	66-150	1.5-2.75	Increased aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; increased respiratory effects in general population.	People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.
Very Unhealthy	201-300	352-526	201-300	151-250	1-1.25	Significant aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; significant increase in respiratory effects in general population.	People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.
Hazardous	300+	526+	300+	250+	Less than 1	Significant aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; significant increase in respiratory effects in general population.	Everyone should avoid all physical activity outdoors.

TACK!



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