

Quel avenir pour notre air ? Respirer un air sain : Challenges et Innovations

Webinaire - 23 & 24 juin 2020



QUALITE DE L'AIR

Présentation des mesures et des réglementations existantes au niveau mondial

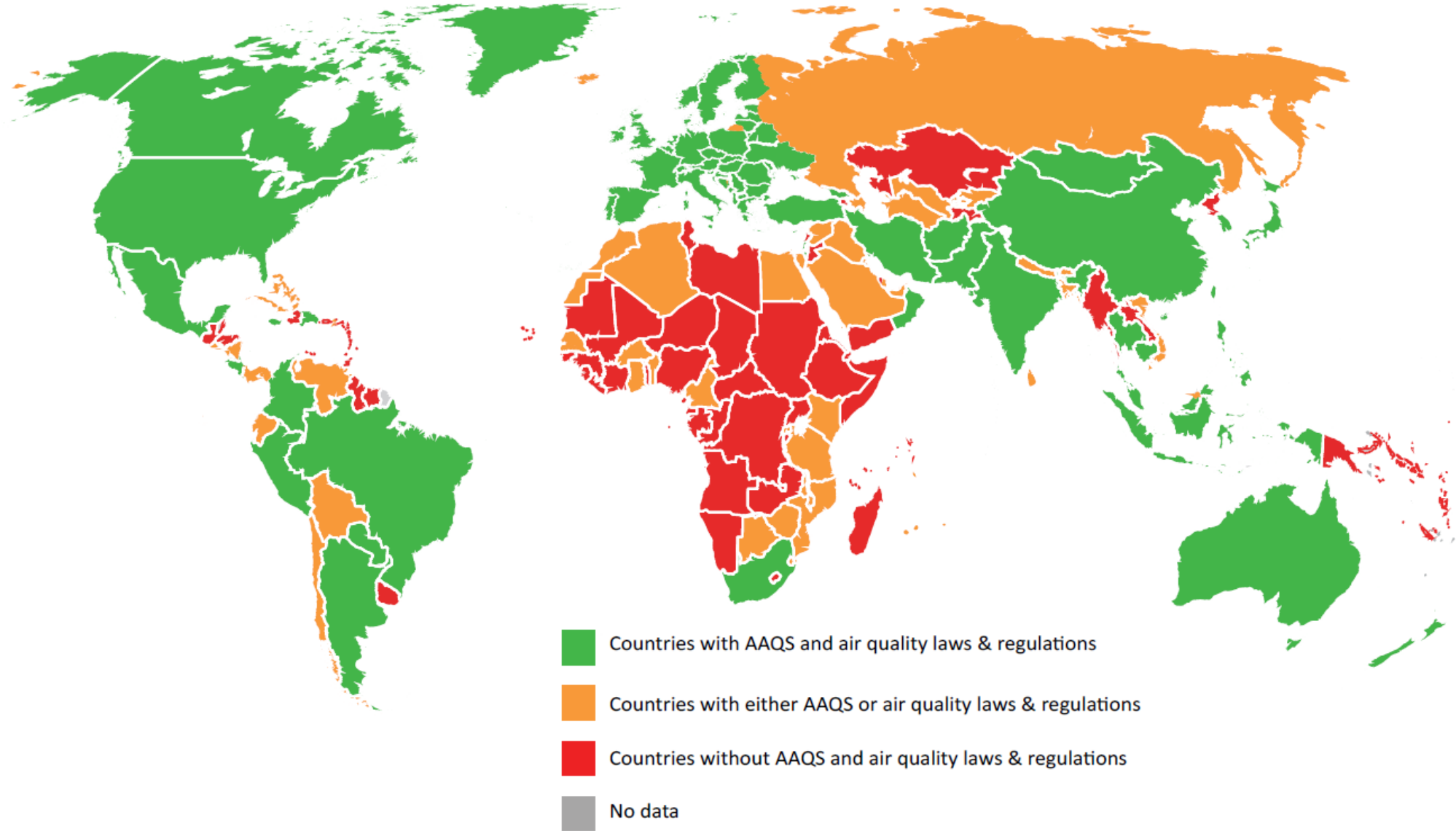


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Règlementations Air Ambient



Pays possédant des lois et/ou des stations de mesures de qualité de l'air permanentes



Source : Nations Unies (2016)

https://wedocs.unep.org/bitstream/handle/20.500.11822/17203/AQ_GlobalReport_Summary.pdf?sequence=1&isAllowed=y

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Extraits de lois nationales de différents pays

Composés	Unité	Durée	OMS (recommandations)	Canada	USA	Brésil	Europe	Arabie Saoudite	Chine	Inde	Japon	Australie
PM10	µg/m ³	Annuelle	20		150 / 24h	50 / 24h	40	80	70	60	100 / 24h	50 / 24h / 3j
PM2.5	µg/m ³	Annuelle	10	8,8	12	25 / 24h	25 / 20 (2020)		35	40	15	8
O ₃	µg/m ³	8 heures	100	124	140	100	120	295 / 24h	160	100	120 / 1h	160
NO ₂	µg/m ³	Annuelle	40	32	100	200 / 1h	40	100	40	40	114 / 24h	57
SO ₂	µg/m ³	24 heures	20	13	10	20	125	365	150	80	100	200
H ₂ S	µg/m ³	24 heures						40				
CO	mg/m ³	8 heures			10	9	10	10	10 / 1h	2	23	10
NH ₃	µg/m ³	Annuelle								100		
BaP	ng/m ³	Annuelle					1		1	1		
As	ng/m ³	Annuelle					6		6	6		
Cd	ng/m ³	Annuelle					5		5			
Ni	ng/m ³	Annuelle					20			20		
Pb	ng/m ³	Annuelle			150		500		500	500		500
Hg	ng/m ³	Annuelle							50			
Cr(VI)	ng/m ³	Annuelle							0,025			
F ⁻	µg/(dm ² ·d)	24 heures						1	7			
Dioxins	pg-TEQ/m ³	Annuelle									0,6	
Benzène	µg/m ³	Annuelle					5			5	3	
Trichloroethylene	µg/m ³	Annuelle									200	
Tétrachloroethylene	µg/m ³	Annuelle									200	
Dichlorométhane	µg/m ³	Annuelle									150	
TSP	µg/m ³	Annuelle							200			
NO _x	µg/m ³	Annuelle							50			

 Recommandations

Sources : OMS et Sites officiels des gouvernements :

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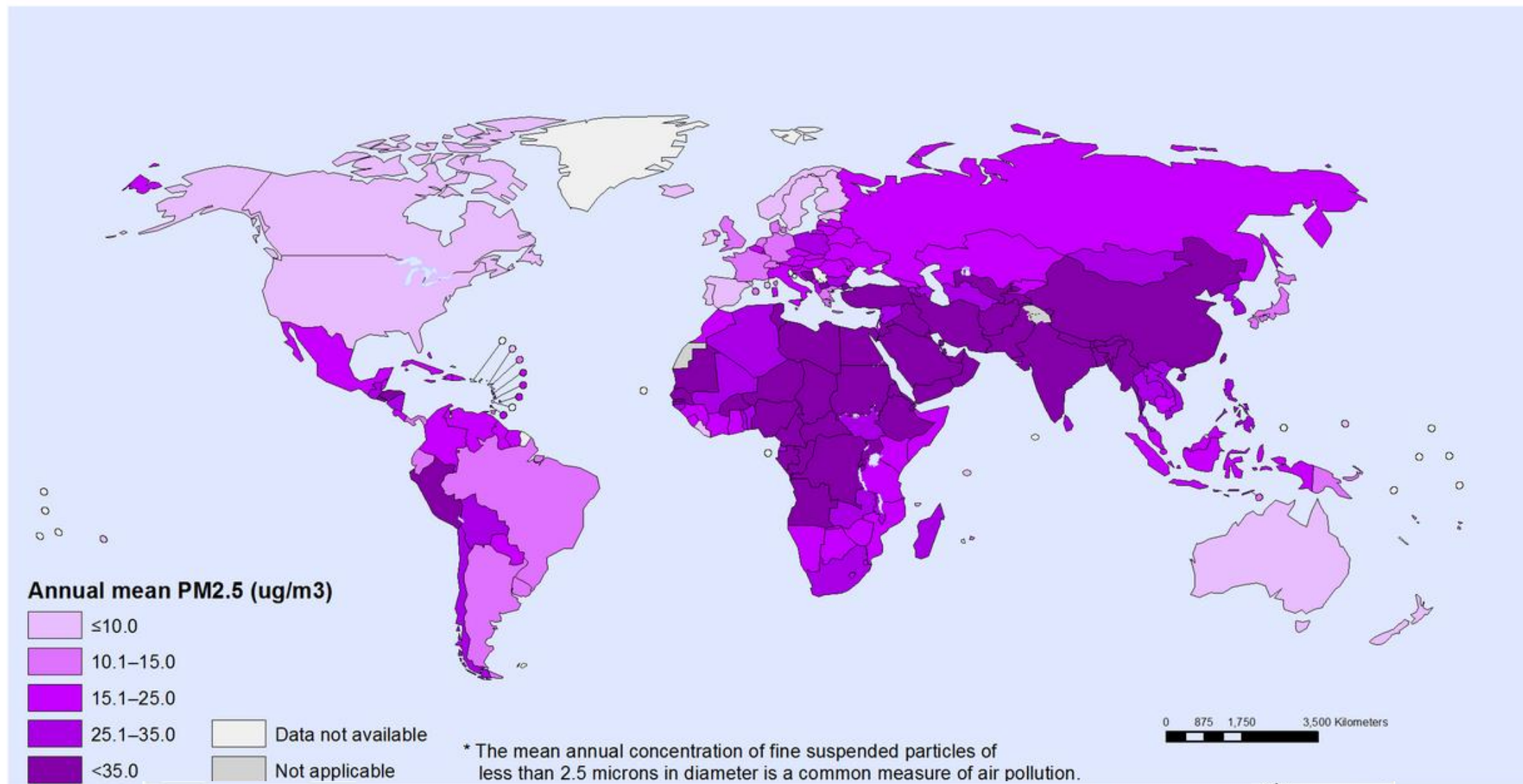
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Quelques mesures dans le monde
PM2.5 – NO₂ - Pb



Annual mean concentrations of fine particulate matter (PM2.5) in urban areas (µg/m3), 2014*



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

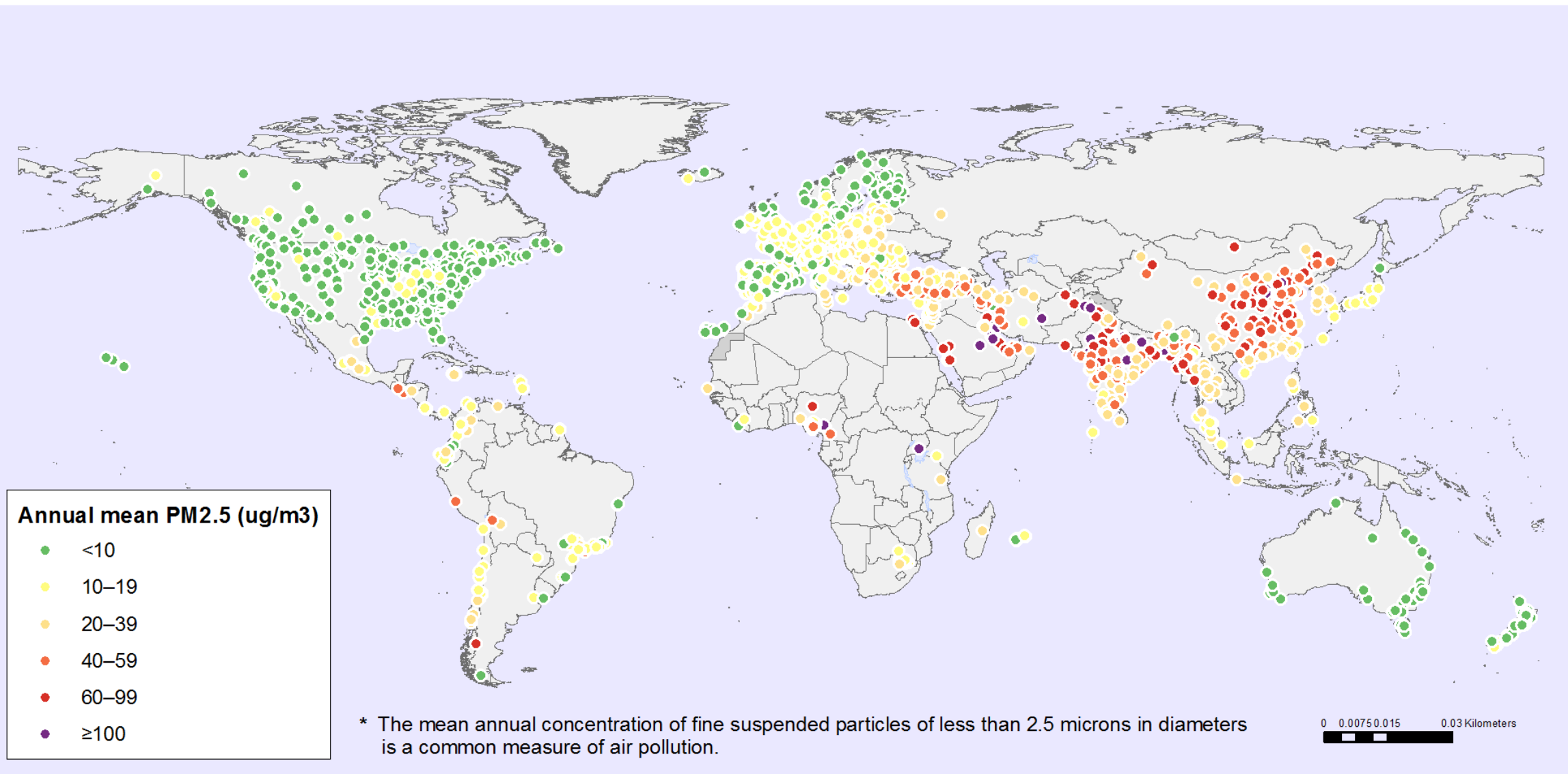
Data Source: World Health Organization
Map Production: Information Evidence and Research (IER)
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Concentration of particulate matter with an aerodynamic diameter of 2.5 µm or less (PM2.5) in nearly 3000 urban areas*, 2008–2015



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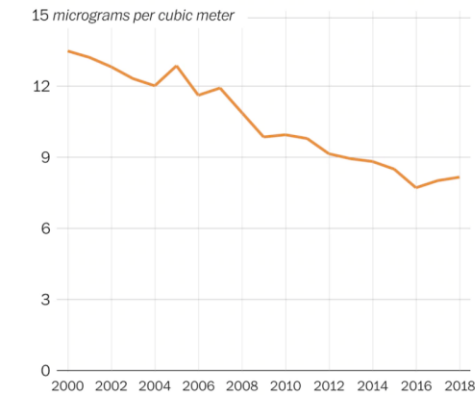
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PM2.5 autour du monde

Air pollution is back on the rise

National average small particulate matter (PM2.5) concentration, 2000 to 2018



Source: Environmental Protection Agency THE WASHINGTON POST

Etats-Unis
Moyenne Annuelle

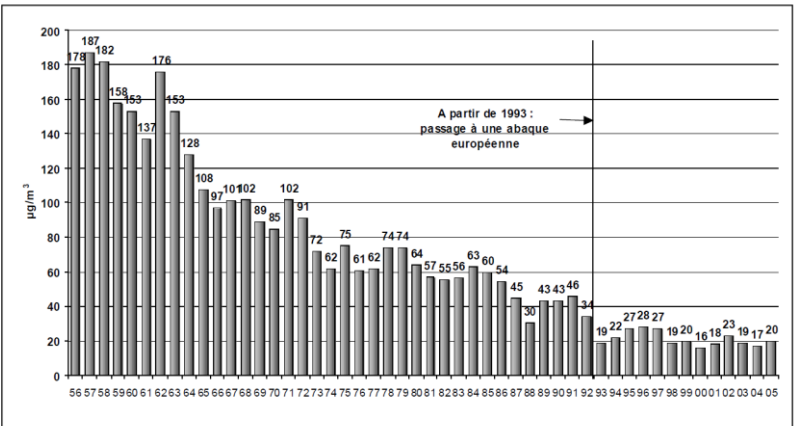


Figure 30 : évolution de la moyenne hivernale de Fumées Noires dans Paris de 1956 à 2006

Paris

A 'satisfactory' week for Delhi

The AQI has been staying between 55 and 70 over the past week

Good 0-50 Satisfactory 51-100 Moderate 101-200
Poor 201-300 Very Poor 301-400 Severe 401-500

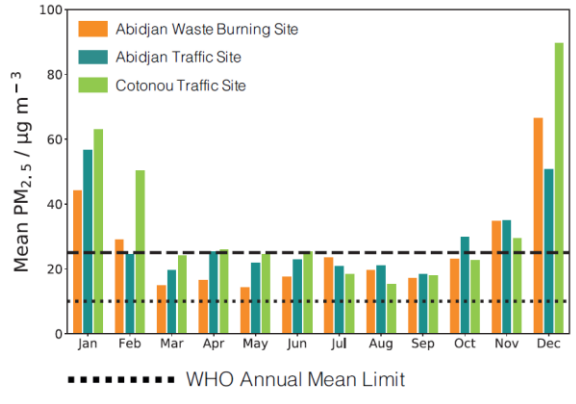
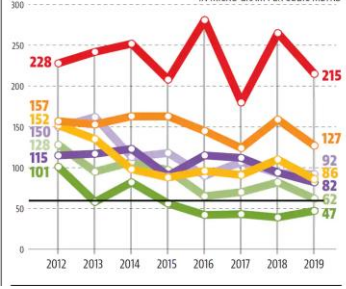


A breath of fresh air

Best air quality this year was experienced on Aug 12

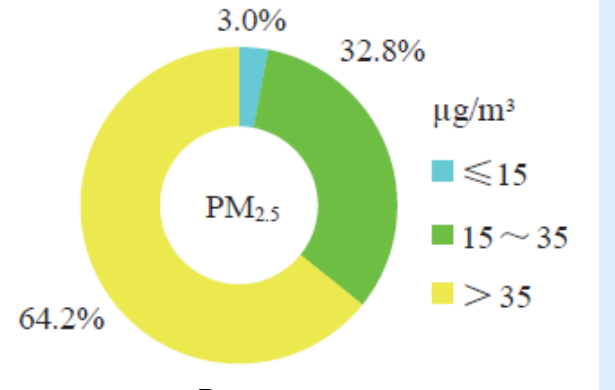
Jan Feb Mar Apr
May Jun July
Safe limits

MONTHLY CITY AVERAGE OF PM2.5
IN MICRO GRAM PER CUBIC METRE



2016

Cotonou et Abidjan



Pourcentage
sur 338 villes Chinoises - 2017

Region	Indicator	Average concentration (CO: mg/m ³ , others: $\mu\text{g/m}^3$)
Beijing-Tianjin-Hebei	PM _{2.5}	64
	PM ₁₀	113
	O ₃	193
	SO ₂	25
	NO ₂	47
	CO	2.8

Moyenne annuelle Jing-Jin-Ji - 2017



Sources : Washington post – Airparif – dacciwa.eu – Hindoustantimes - Rapport Environnemental Chinois 2017

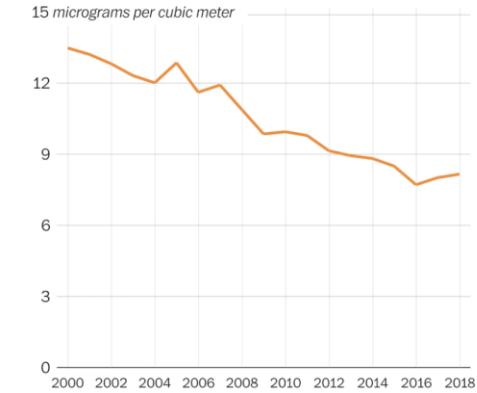
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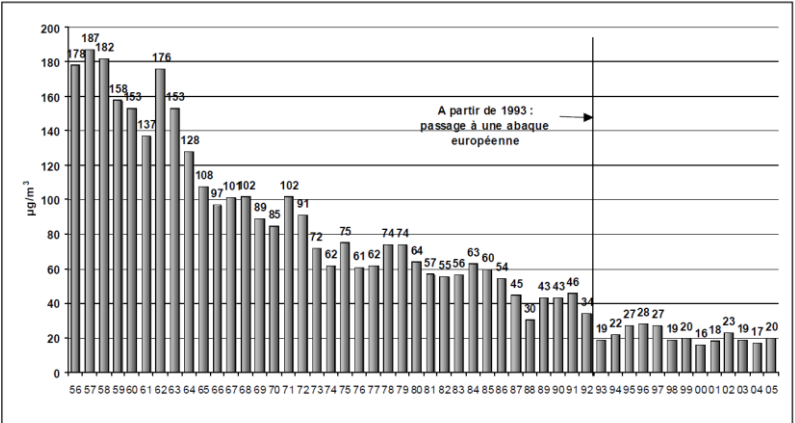


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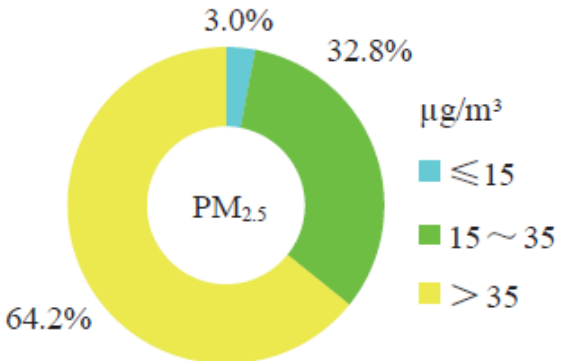
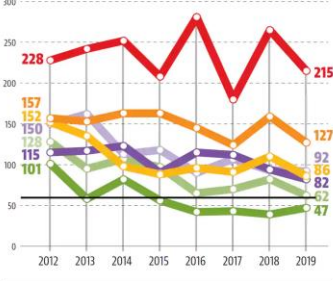


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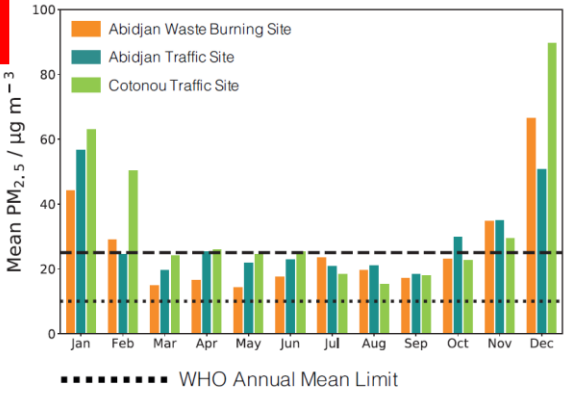
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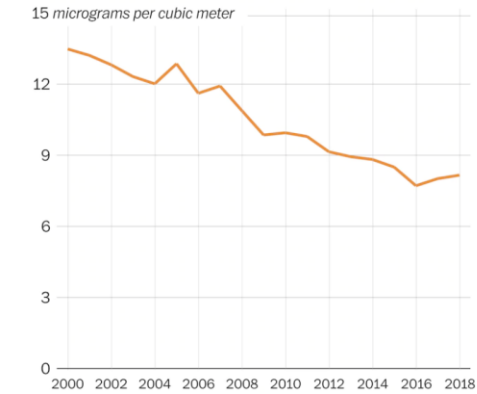
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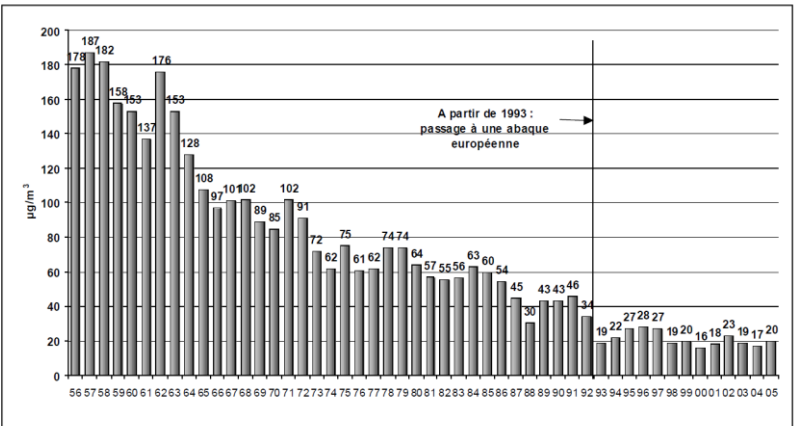


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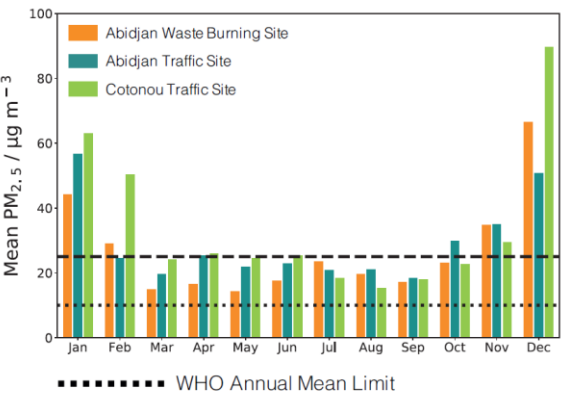
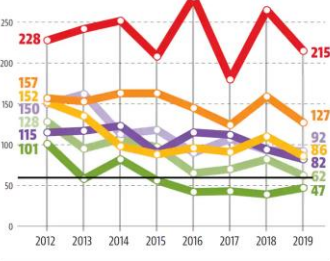
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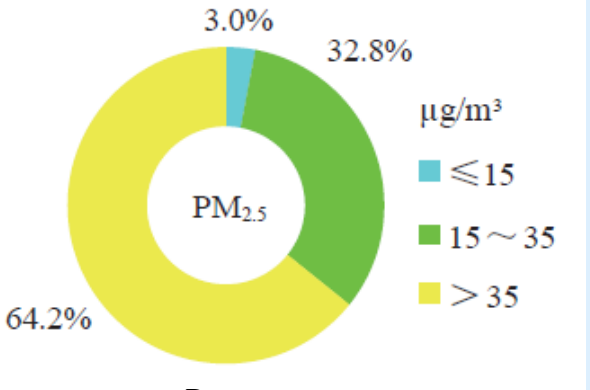
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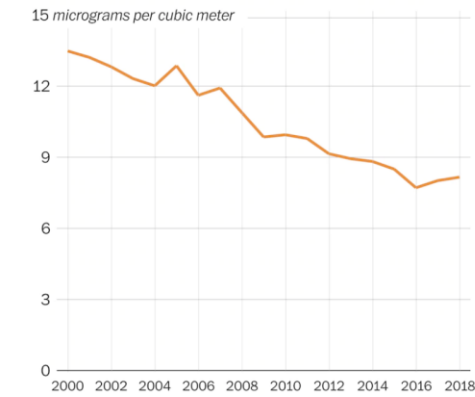


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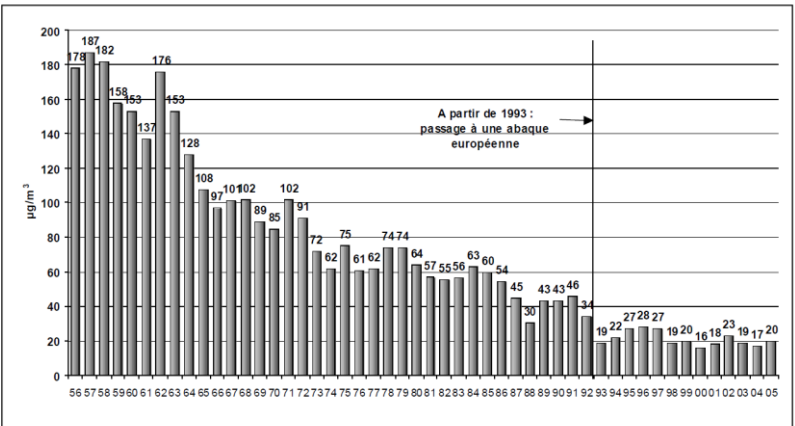


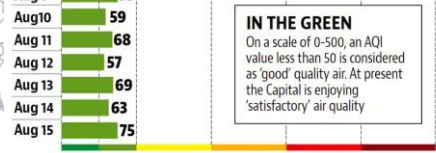
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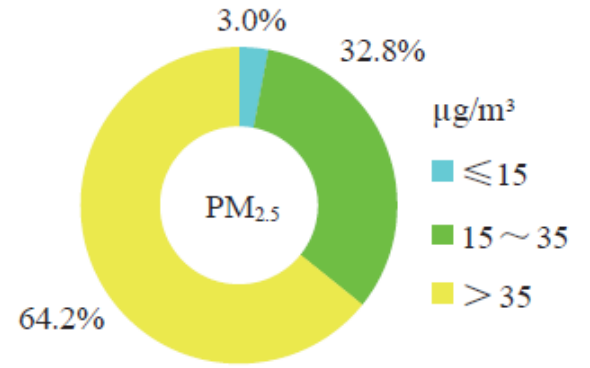
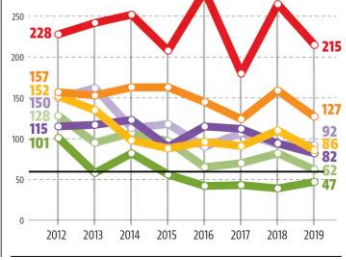
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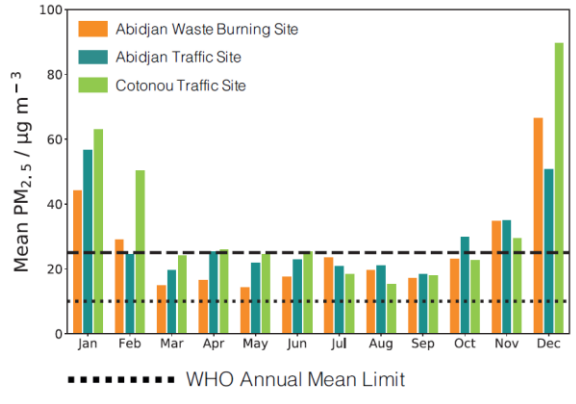
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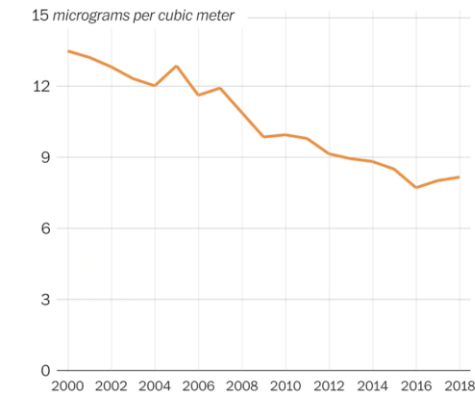
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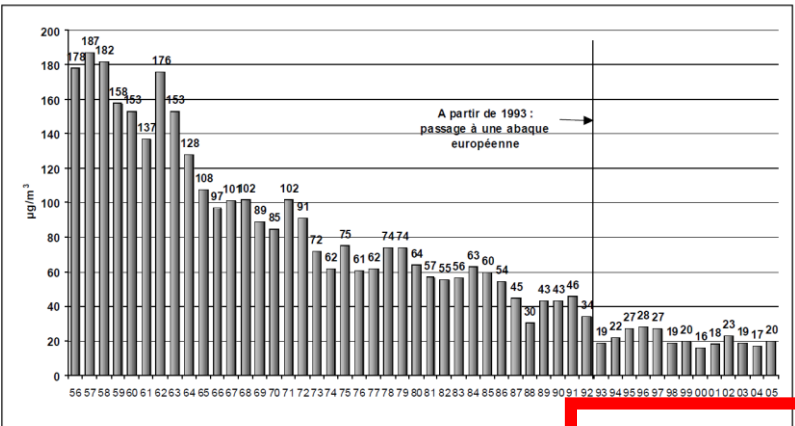
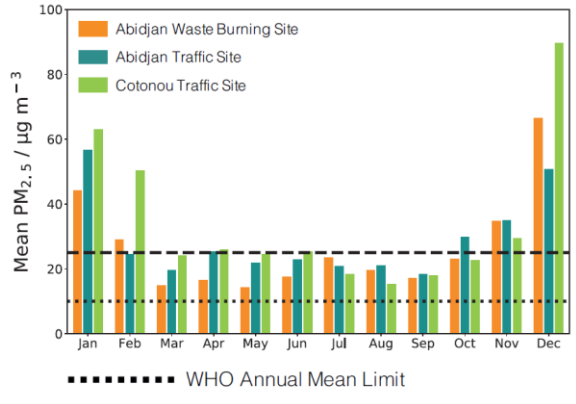


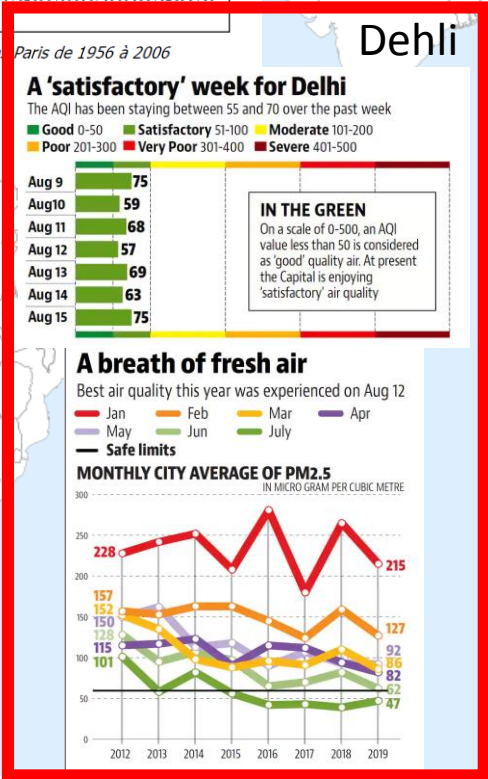
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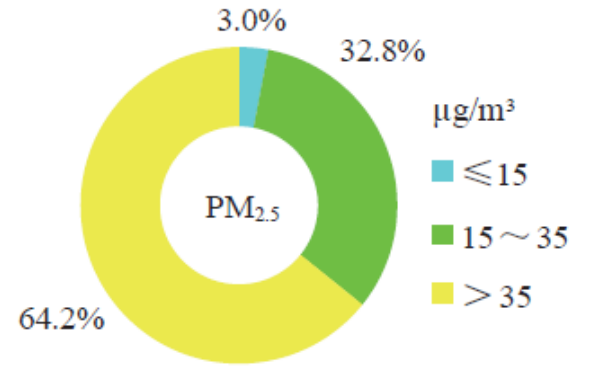


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Dehli



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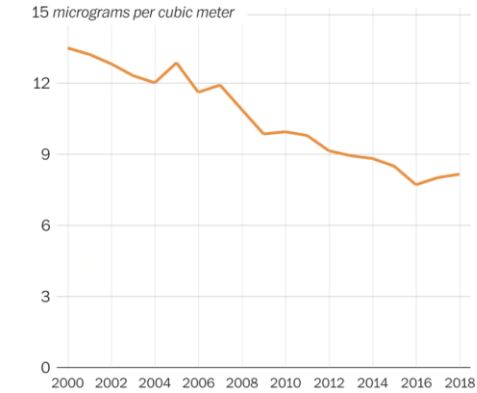
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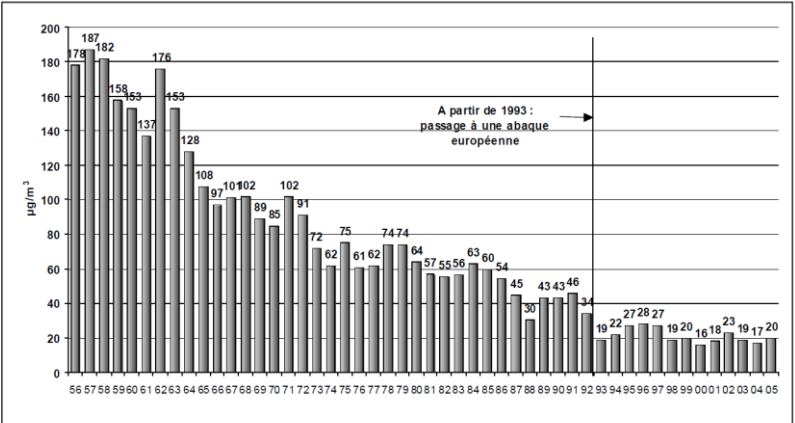


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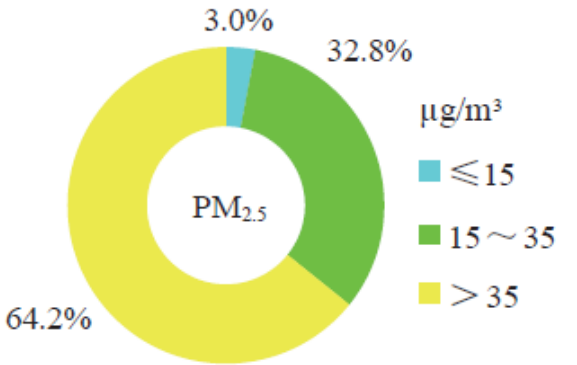
A 'satisfactory' week for Delhi

The AQI has been staying between 55 and 70 over the past week

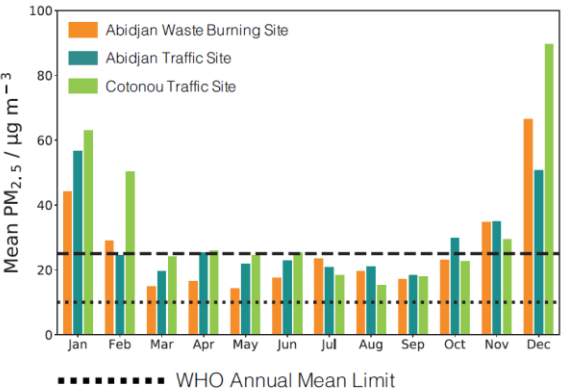
Good 0-50 Satisfactory 51-100 Moderate 101-200
Poor 201-300 Very Poor 301-400 Severe 401-500



Dehli



Pourcentage
sur 338 villes Chinoises - 2017



2016

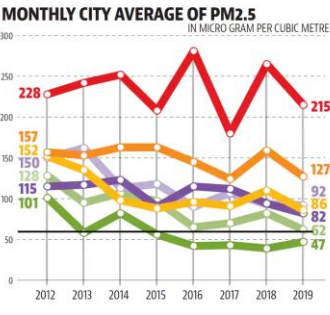
Cotonou et Abidjan

A breath of fresh air

Best air quality this year was experienced on Aug 12

Jan Feb Mar Apr
May Jun July

Safe limits



Region	Indicator	Average concentration (CO: mg/m³, others: µg/m³)
Beijing-Tianjin-Hebei	PM _{2.5}	64
	PM ₁₀	113
	O ₃	193
	SO ₂	25
	NO ₂	47
	CO	2.8

Moyenne annuelle Jing-Jin-Ji - 2017

Sources : Washington post – Airparif – dacciwa.eu – Hindoustantimes - Rapport Environnemental Chinois 2017

Jean-Clair BALLOT – Webinaire 22-23 juin 2020 - Quel avenir pour notre air ? respirer un air sain : Challenges et Innovations

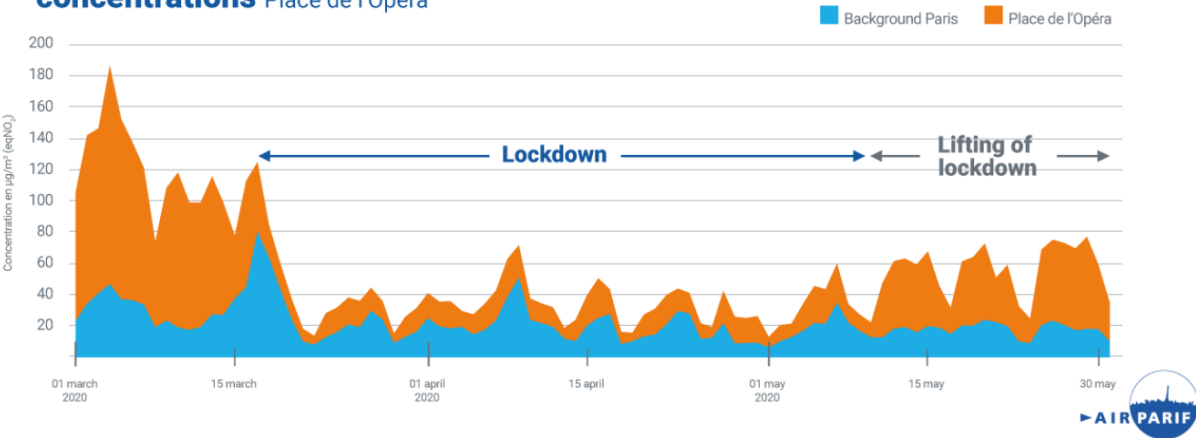


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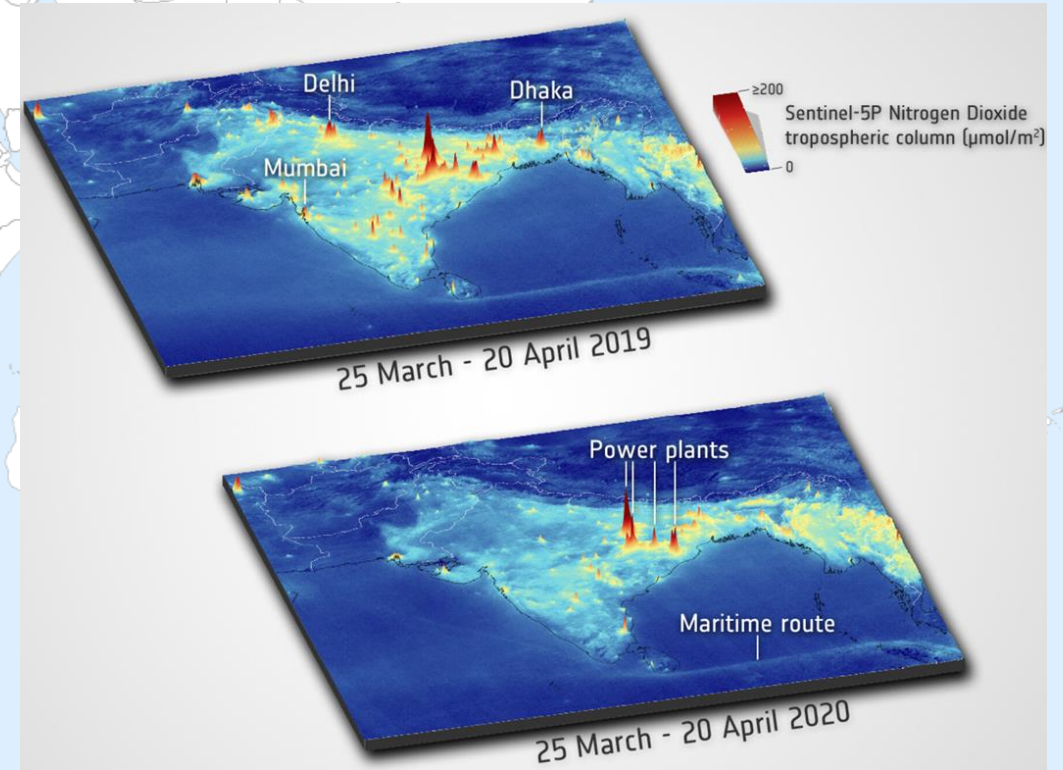
2020 Covid-19 Lockdown situation comparison

Paris – Place de l'Opéra

Evolutions of daily nitrogen oxides (NO_x) concentrations Place de l'Opéra



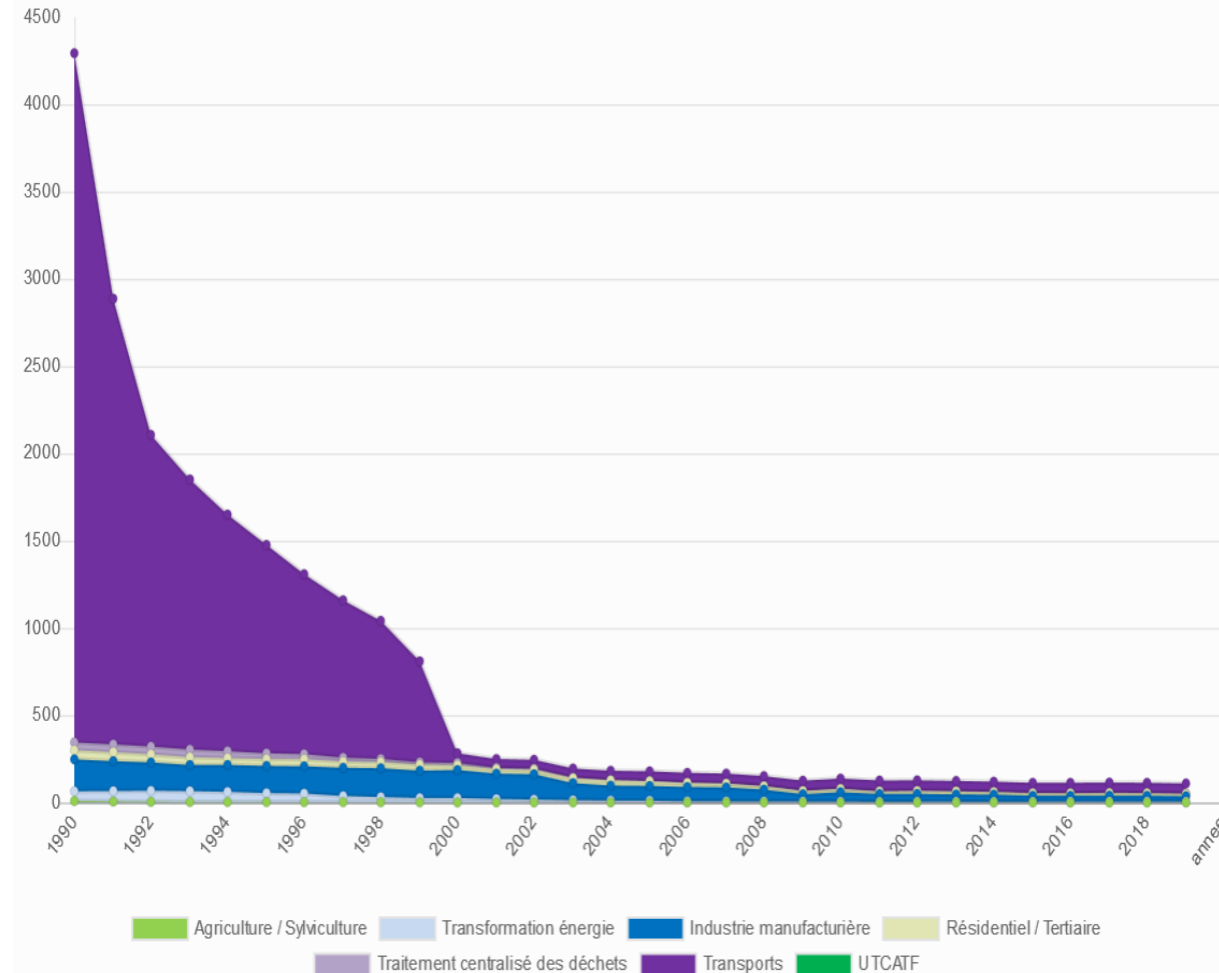
Evolution of daily nitrogen oxide (NO_x) concentrations at the Place de l'Opéra measuring station, before, during and after the lockdown, and the impact of road traffic.



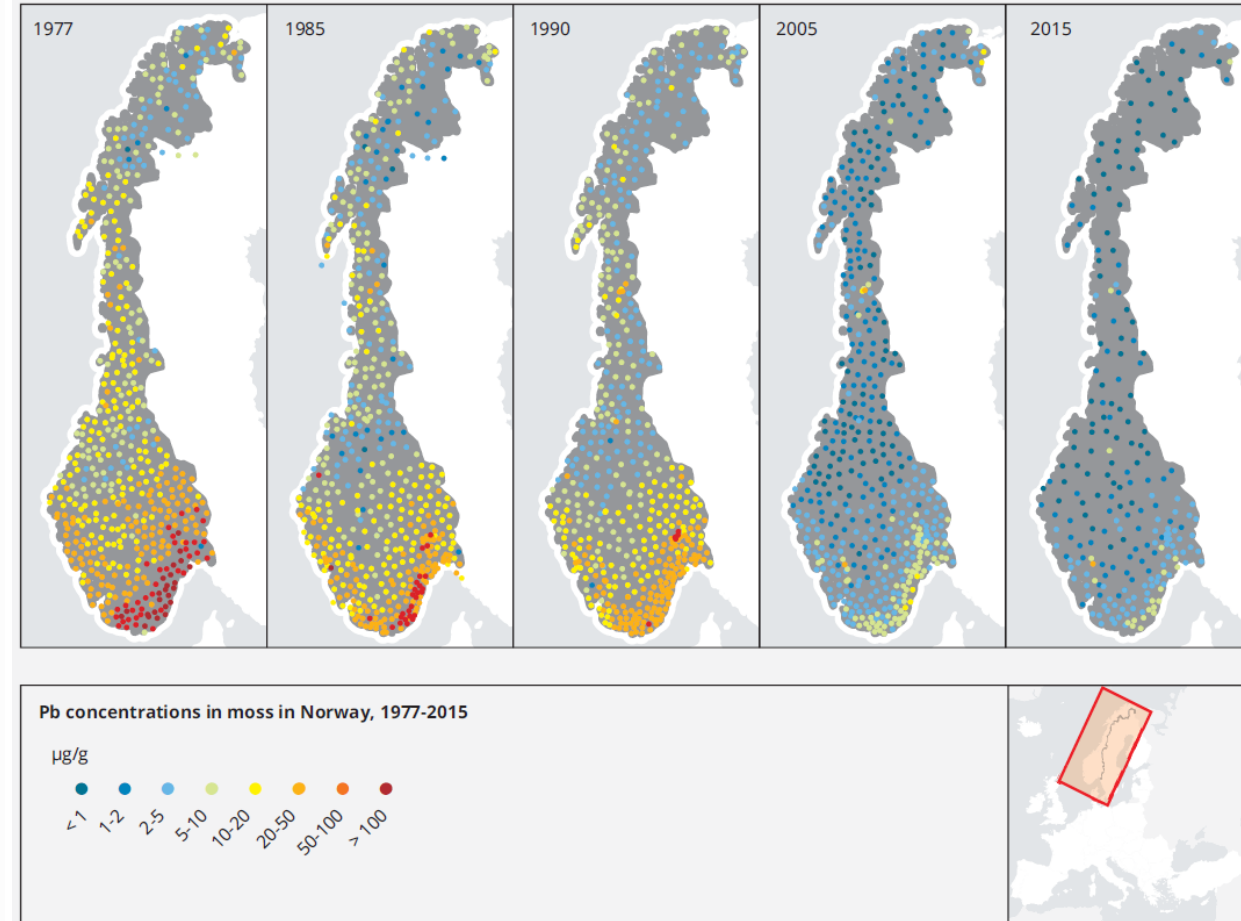
18

Mesures du Plomb dans le temps

Evolution des émissions de Pb de 1990 à 2018 pour la France métropolitaine (en t)



Map 8.1 Temporal trends in Pb concentrations in moss in Norway



Source: Steinnes et al., 2016.

QUALITE DE L'AIR

Air Intérieur



20

Valeurs guides

Composés	Unité	Durée	OMS (recommandations)	France
Benzene	$\mu\text{g}/\text{m}^3$	Annuelle	-	20
CO	mg/m^3	15 minutes	100	100
Formaldéhyde	mg/m^3	30 minutes	0,1	
Naphtalene	mg/m^3	Annuelle	0,01	0,01
NO2	mg/m^3	Annuelle	40	20
Radon	mg/m^3		-	
Trichloroethylene	mg/m^3	Annuelle	-	0,8
Tétrachloroethylene	mg/m^3	Annuelle	0,25	1,38
Acroléine	$\mu\text{g}/\text{m}^3$	Annuelle		0,8
Acétaldéhyde	$\mu\text{g}/\text{m}^3$	Annuelle		160
Ethylbenzène	$\mu\text{g}/\text{m}^3$	Annuelle		1 500
Formaldéhyde	$\mu\text{g}/\text{m}^3$	24 heures		100
Toluène	$\mu\text{g}/\text{m}^3$	24 heures		20 000

 Recommandations

Note : Il existe également des réglementations concernant des valeurs limites d'expositions professionnelles, les établissements recevant du public
Elles ne sont pas traitées dans ce document

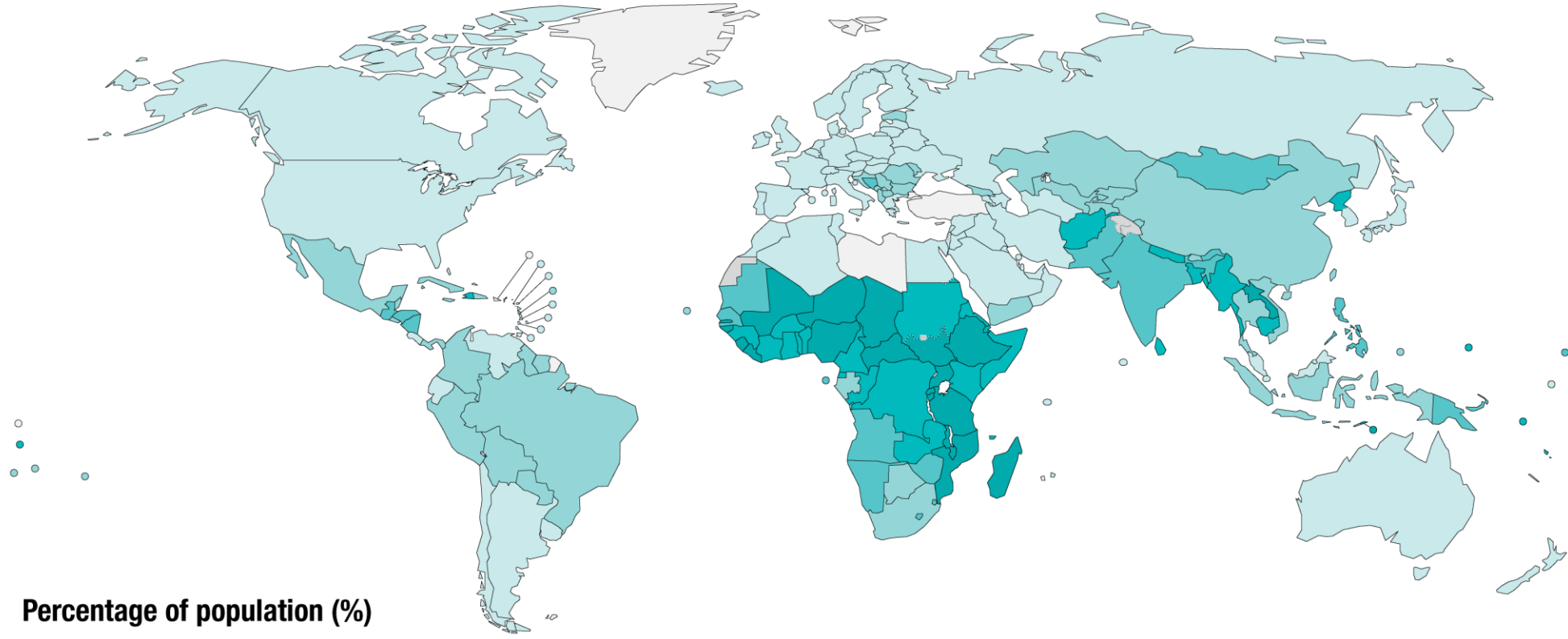
Sources : OMS - ANSES

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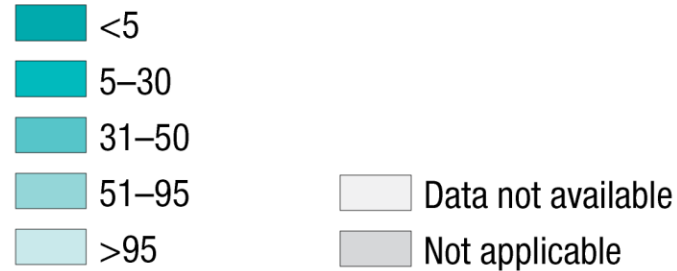


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Proportion of population with primary reliance on clean fuels (%), 2014



Percentage of population (%)



0 750 1500 3000 Kilometres

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement. © WHO 2016. All rights reserved.

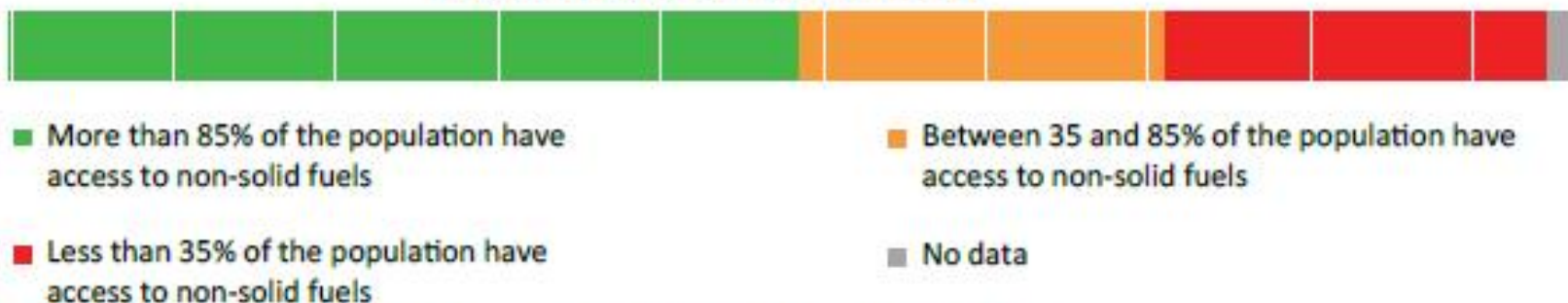
Data Source: World Health Organization
Map production: Information Evidence and Research (IER)
World Health Organization



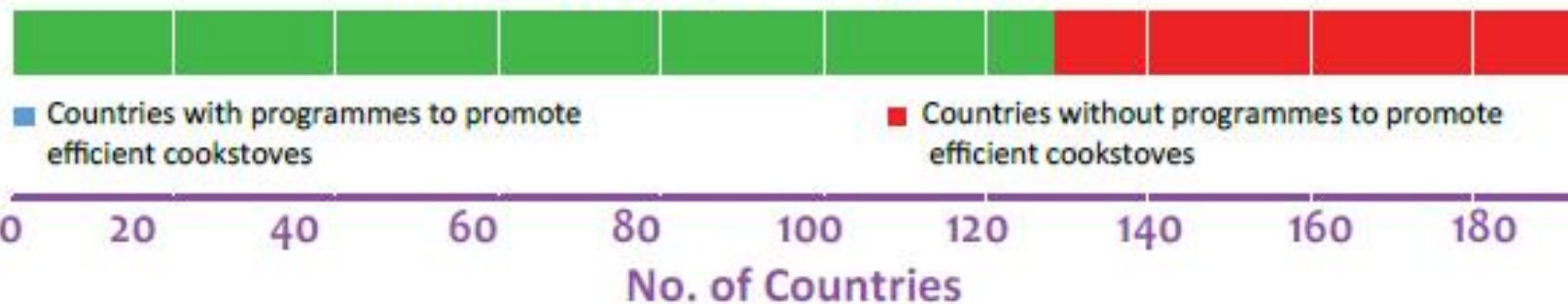


INDOOR AIR POLLUTION

Access to Non-Solid Fuels

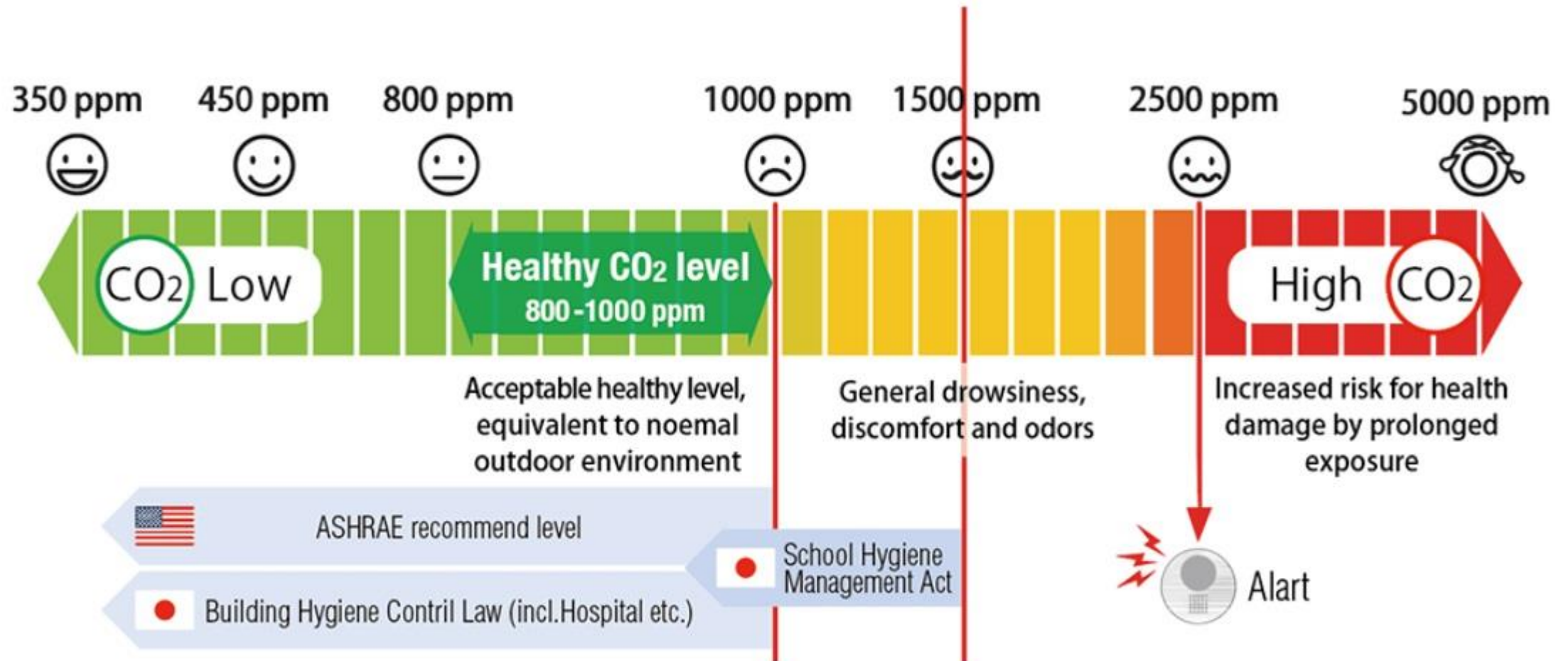


Efficient Cook / Heating Stoves



Source : WHO

Le dioxyde de carbone (CO₂)



Source : CHC group

Merci de votre attention

