DIEP Lazio
Dipartimento di Epidemiologia
del Servizio Sanitario Regionale
Regione Lazio (ex ASL Roma E)

SISTEMA SANITARIO REGIONALE
ASL ROMA 1
REGIONE LAZIO

Effetti delle ondate di calore sulla salute e sottogruppi di suscettibili

Francesca de'Donato, Manuela De Sario, Matteo Scortichini, Federica Asta, Patrizia Schifano, Michela Leone, Daniela D'Ippoliti, Claudia Marino, Adele Lallo, Giovanna Cappai, Marina Davoli, Paola Michelozzi

Dipartimento di Epidemiologia SSR Regione Lazio/ASL Roma 1, Centro di Competenza DPC

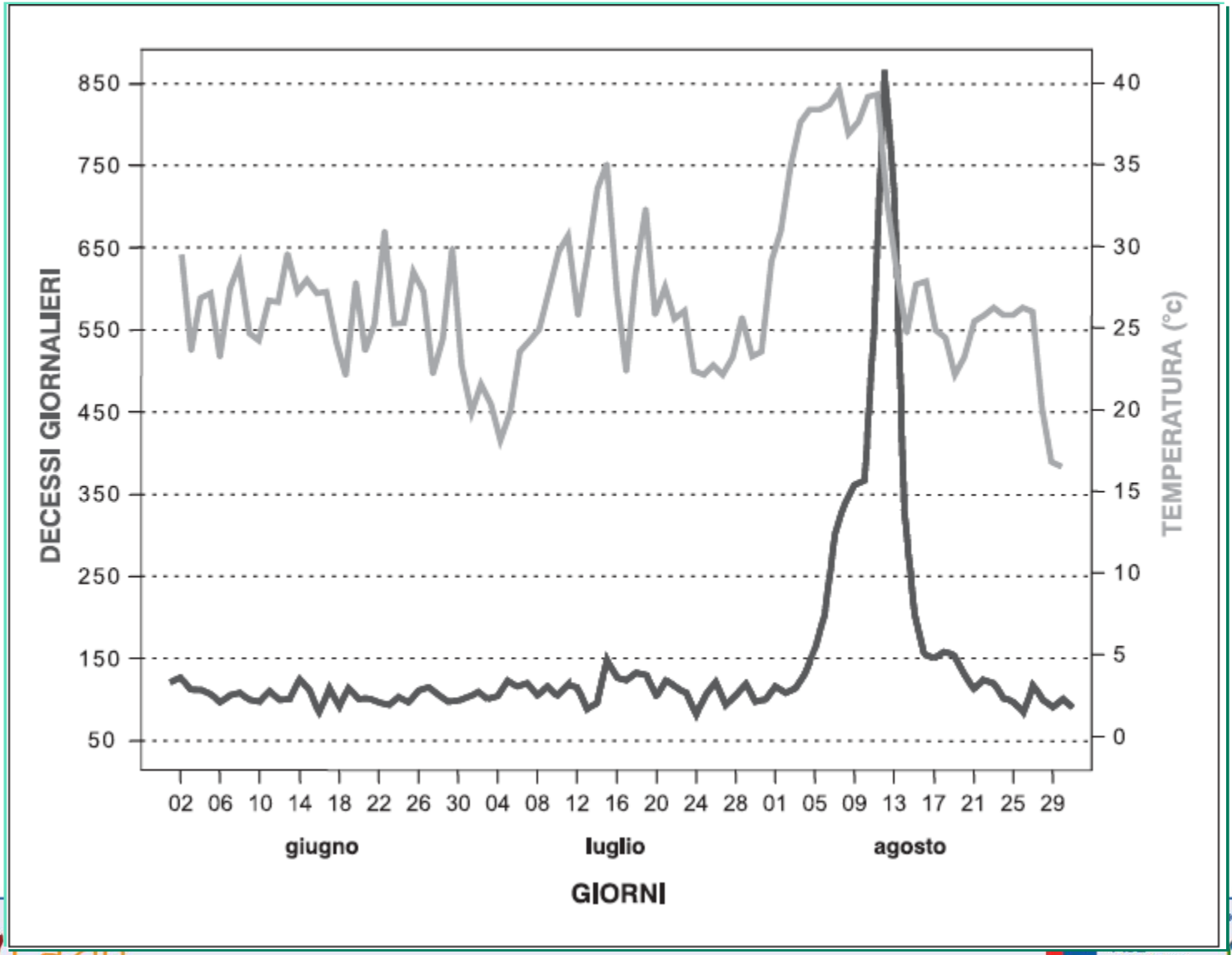
Annamaria de Martino - Ministero della Salute

Ministero della Salute - Roma, 30 maggio 2016

Effetti sulla salute associati alle ondate di calore:

1. L’effetto del caldo sulla mortalità è immediato (lag 0-3 giorni dal picco di temperatura)

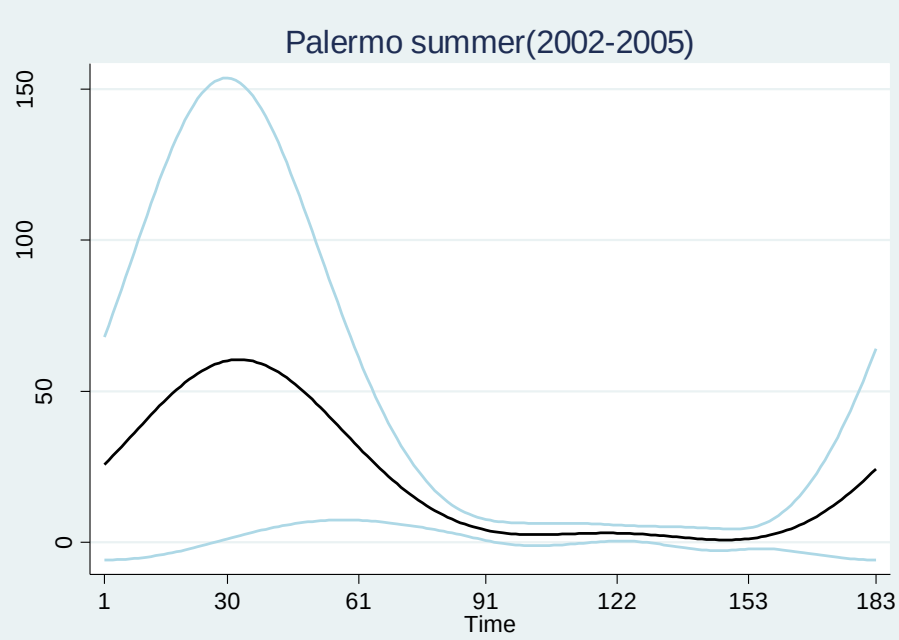
Ondata di calore 2003, Parigi

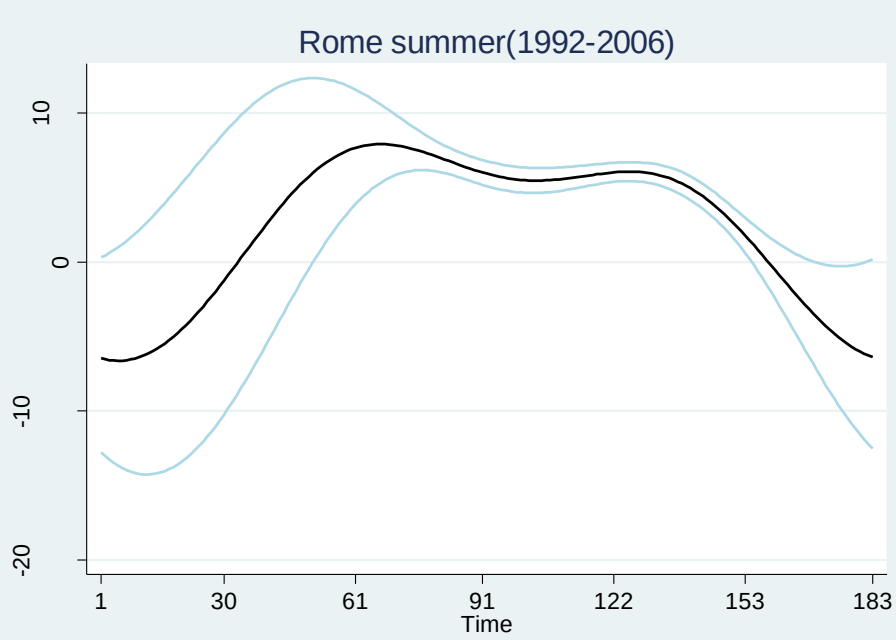


Effetti sulla salute associati alle ondate di calore:

2. Maggiore effetto delle prime ondate di calore della stagione

Variazione dell'effetto delle alte temperature sulla mortalità giornaliera nel corso della stagione estiva





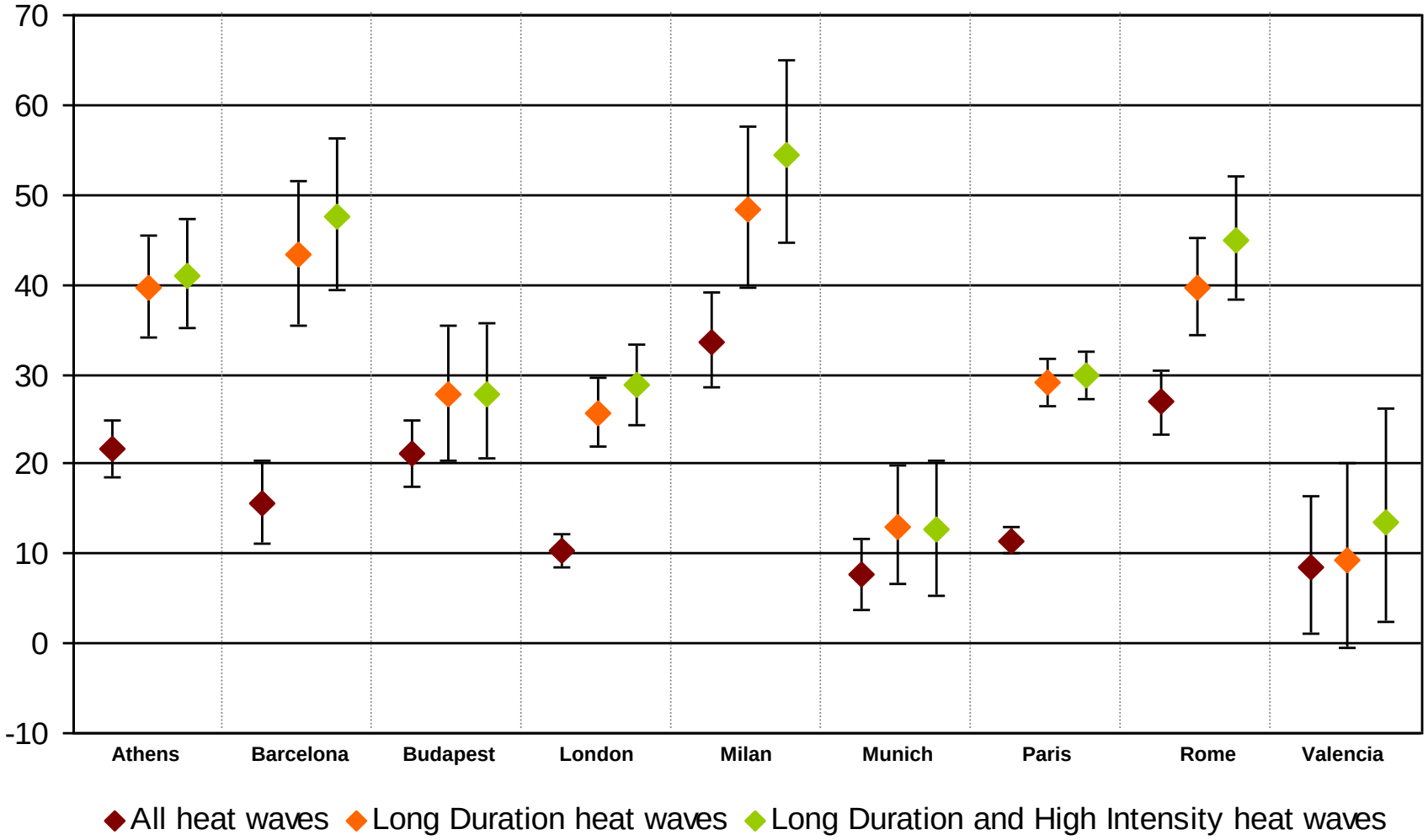
Progetto CIRCE

Effetti sulla salute associati alle ondate di calore:

3. Durata e intensità dell'ondata di calore sono associate ad un rischio maggiore

Caratteristiche delle ondate di calore:

Effetti delle ondate di calore sulla mortalità per durata e intensità

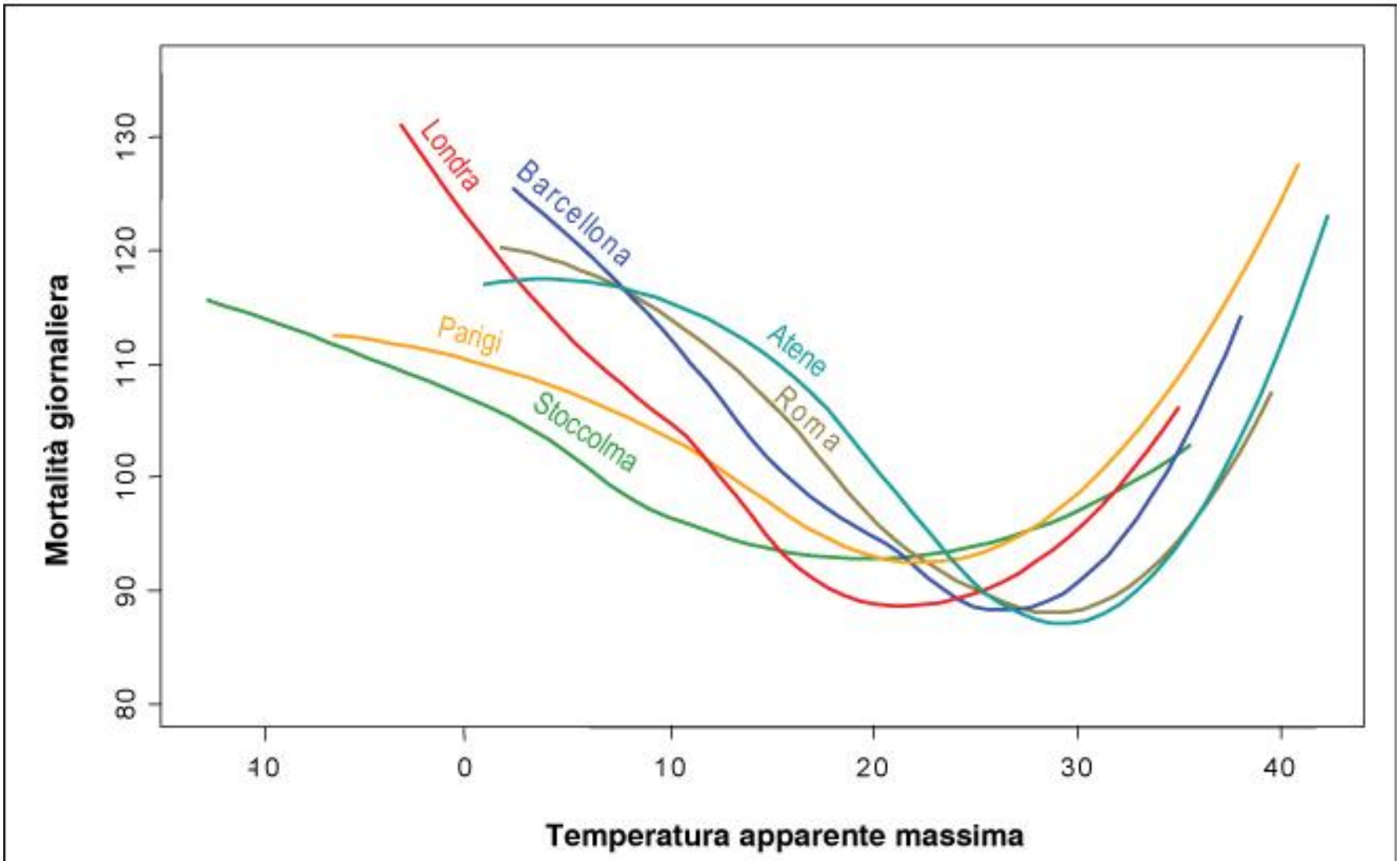


D'Ippoliti *et al. Environmental Health* 2010, **9**:37

Effetti sulla salute associati alle ondate di calore:

4. Eterogeneità geografica e temporale

Relazione temperatura-mortalità nelle città Europee

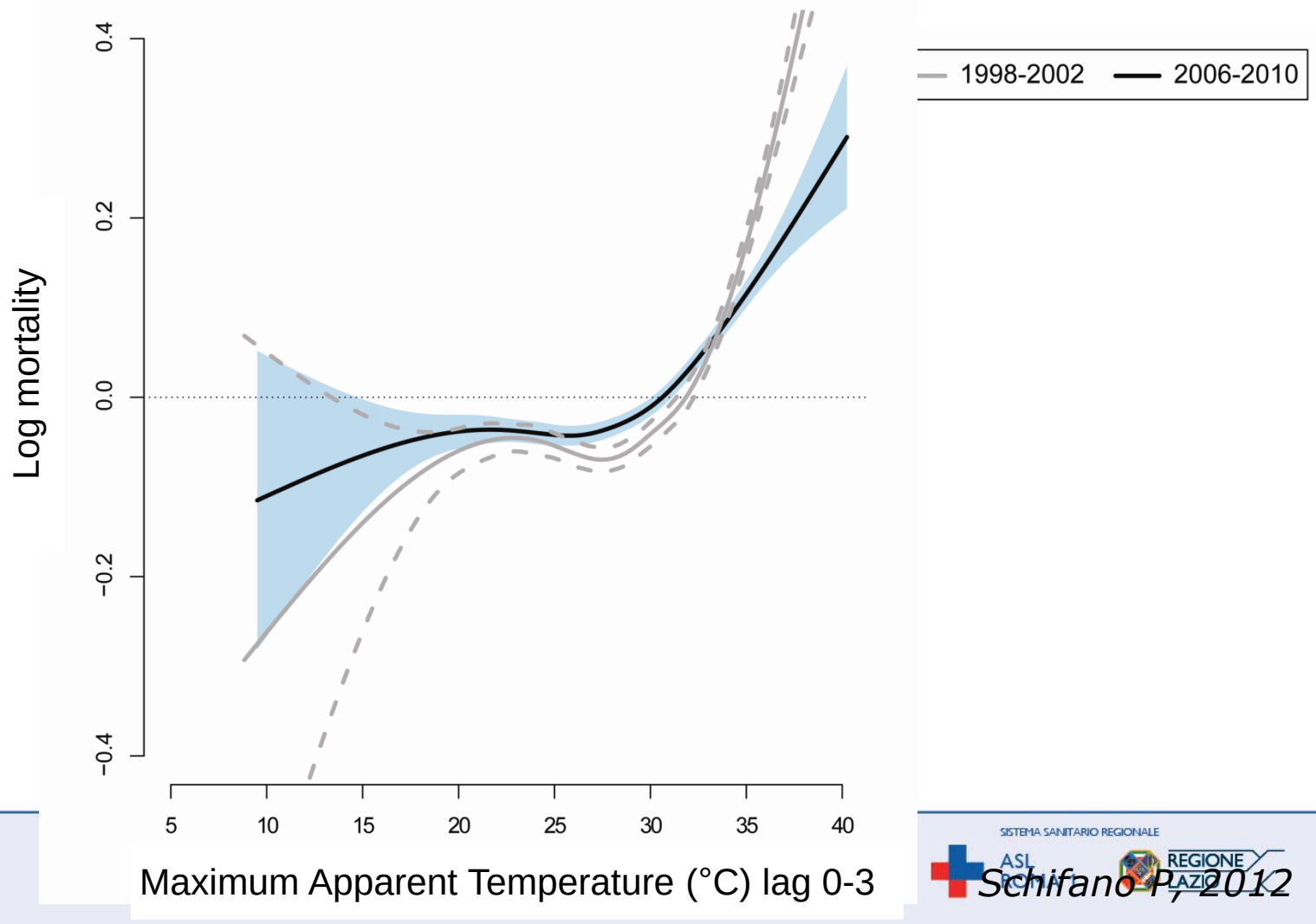


Fonte: Progetto PHEWE, 2006

Stima del valore soglia e dell'incremento % di mortalità giornaliera per 1°C sopra la soglia

(Progetto PHEWE, Baccini M et al, 2008)

Relazione temperatura-mortalità in 16 città italiane prima e dopo l'introduzione dei piani di prevenzione (estate 1998-2002 e 2006-2010) nella popolazione di età 65+

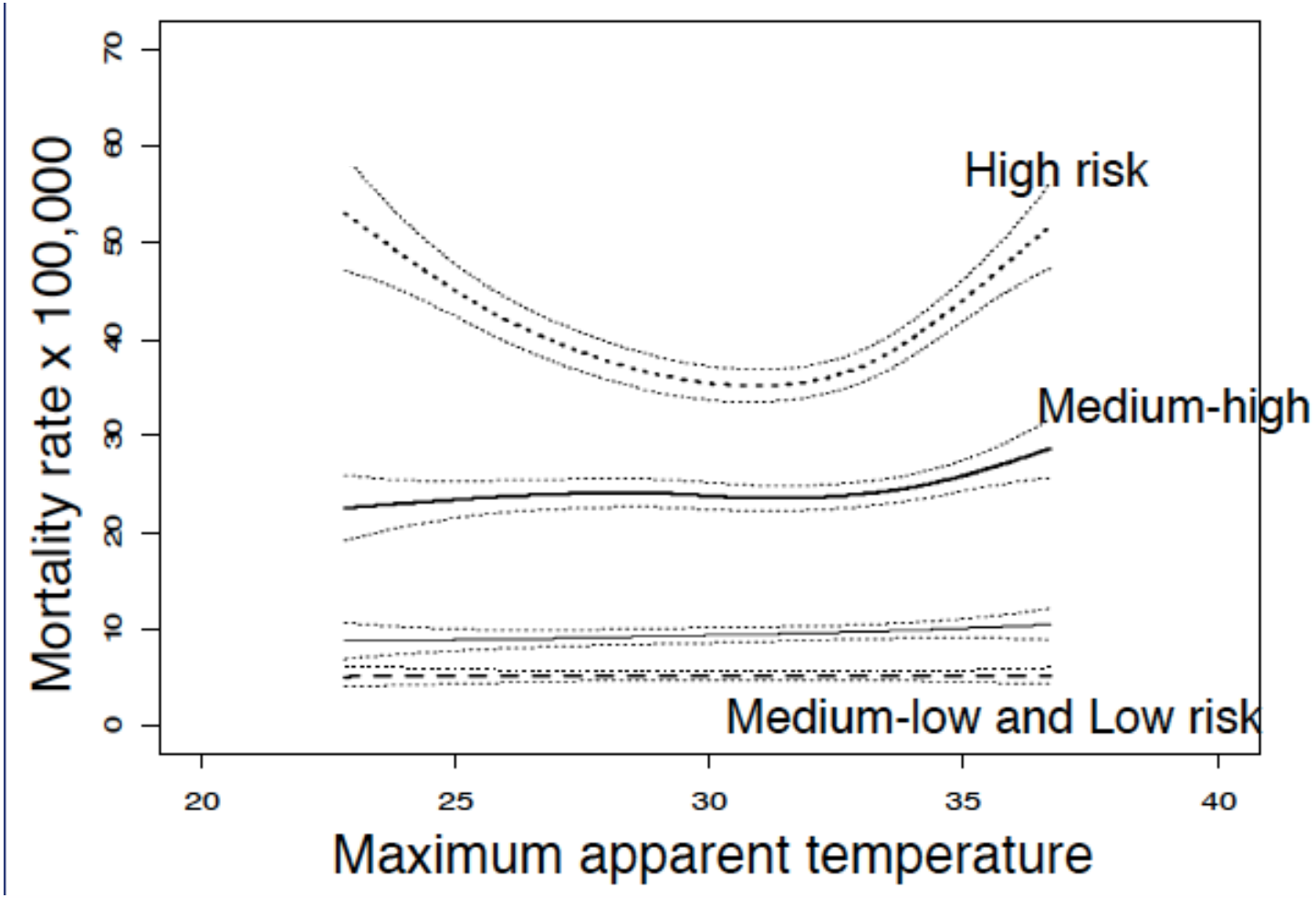


Schifano P, 2012

Effetti sulla salute associati alle ondate di calore:

5. Effetto maggiore in sottogruppi suscettibili

Variazioni della relazione temperatura-mortalità per livello di suscettibilità, Roma, 2009



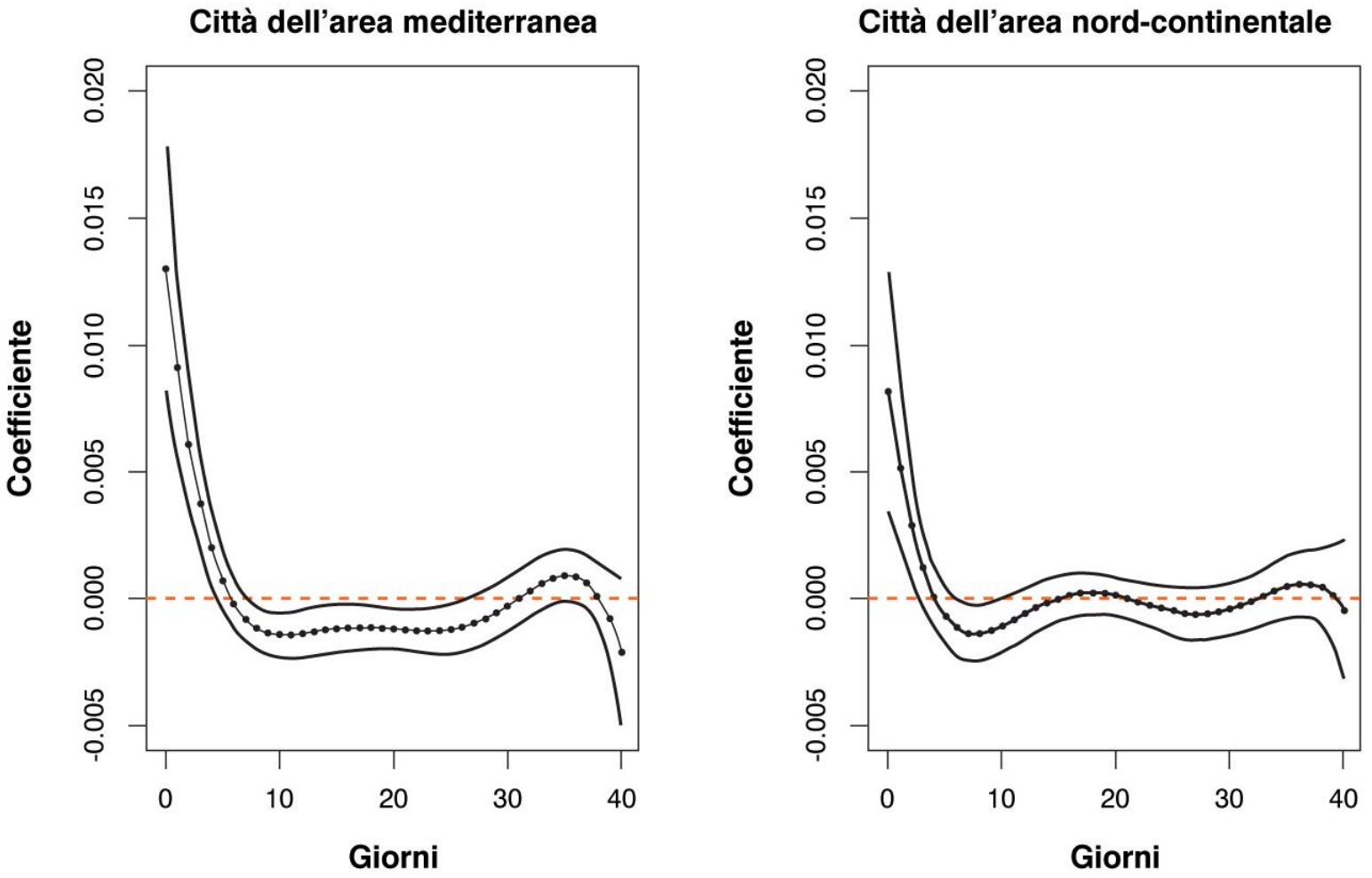
Michelozzi et al. unpublished

Effetti sulla salute associati alle ondate di calore:

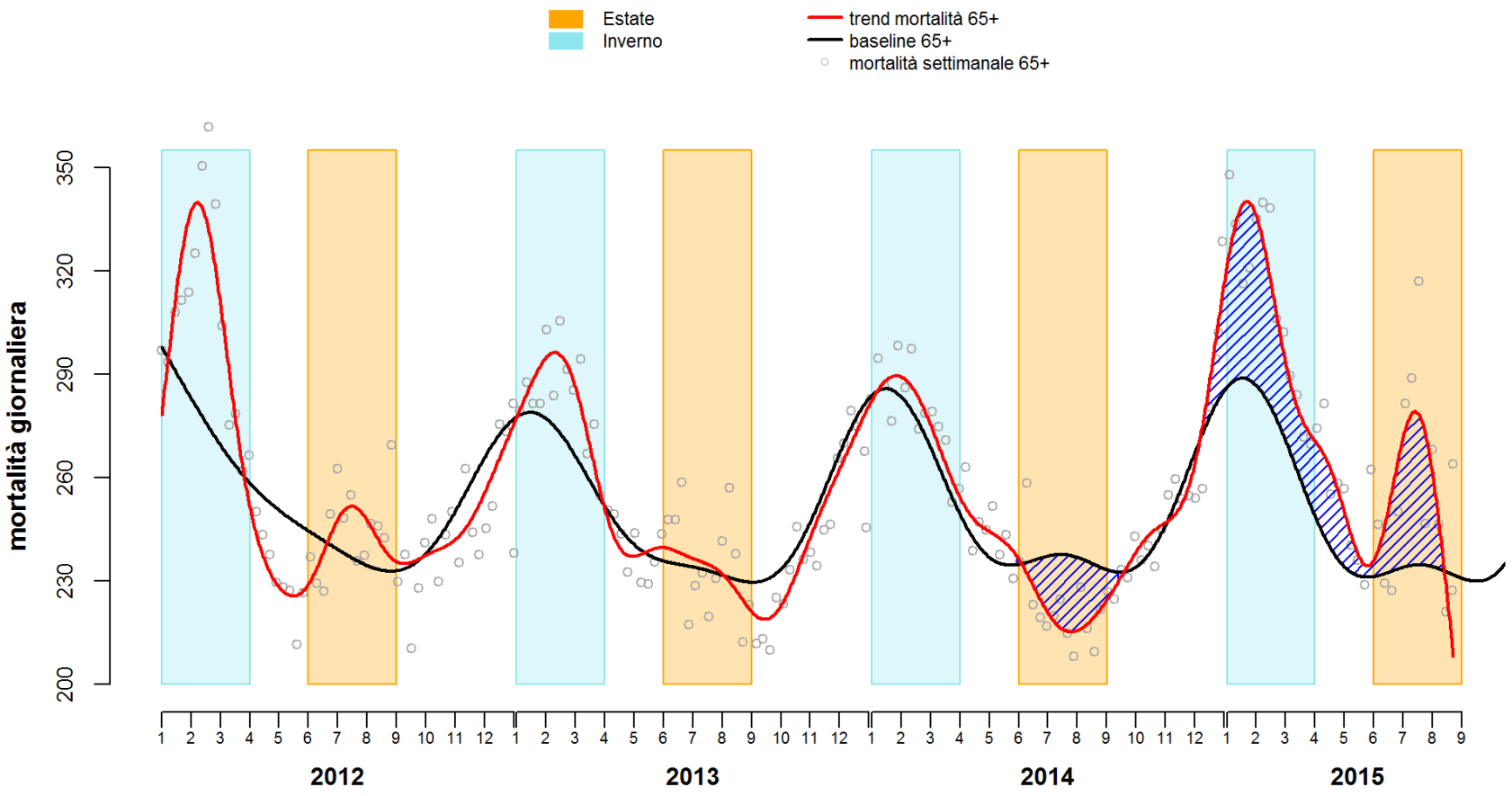
6. Harvesting effect ?

Effetto harvesting

(Progetto PHEWE, Baccini M et al, 2008)



effetto “Harvesting” nelle città italiane, 2012-2015



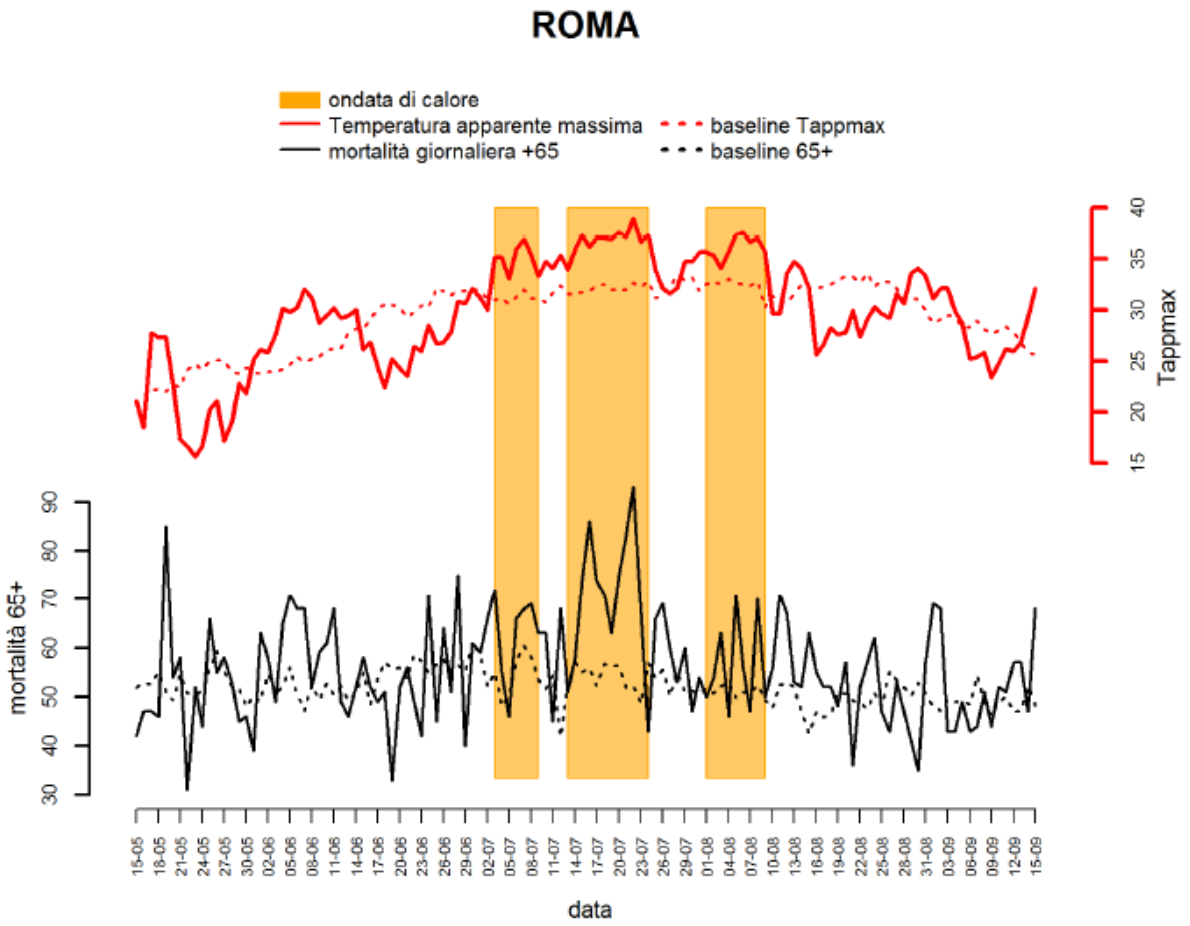
Come si stima l'effetto del caldo durante le ondate di calore?

Confronto decessi osservati con un valore atteso calcolato su 5 anni di serie storica (es. 2015 vs periodo 2009-2013).

Mortalità giornaliera attesa (baseline-metodo 1): definita come la media per giorno della settimana e numero della settimana nell'anno sui dati di serie storica di mortalità della popolazione di età 65+ anni

Baseline – metodo 2: mortalità attesa aggiustata per la popolazione

Estate 2015: ondata di calore di luglio



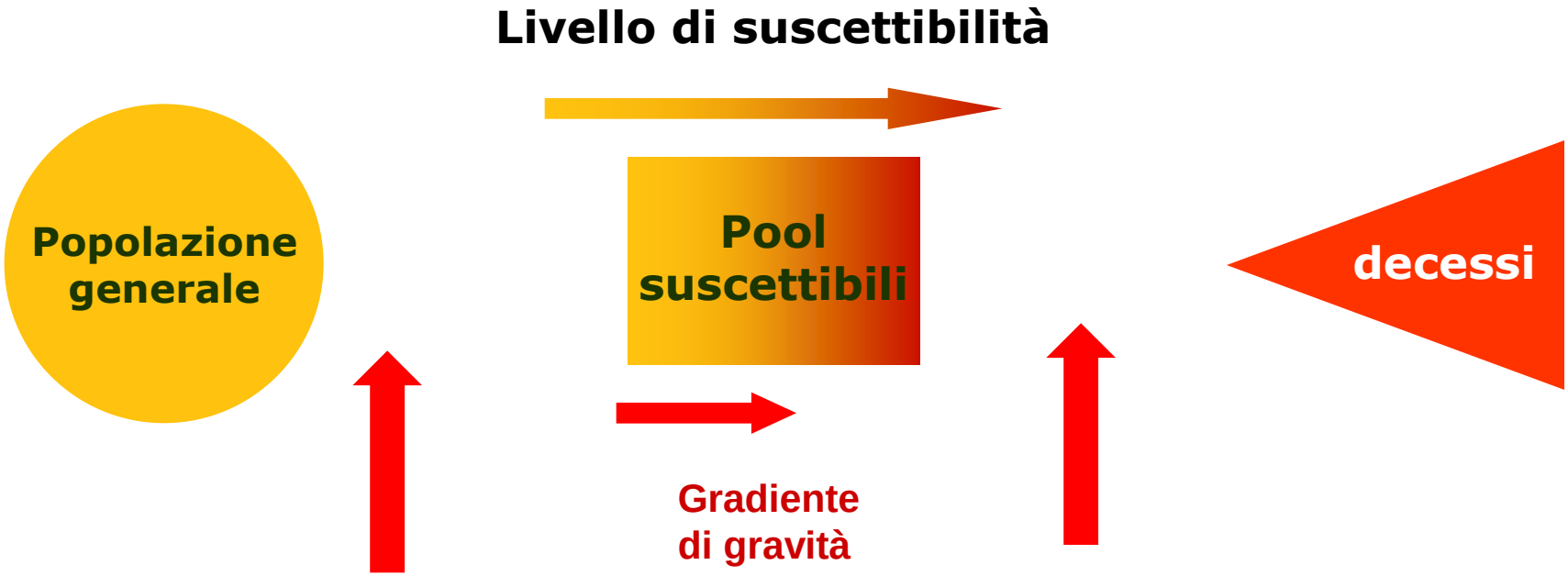
Estate 2015: ondata di calore di luglio

Città	Decessi nella classe di età 65 e oltre				
	Osservati	Eccesso		Variazione percentuale	
		(metodo 2)	(metodo 1)	(metodo 2)	(metodo 1)
BOLZANO	34	-11	-6	-24	-15
TORINO	443	112	131	34	42
MILANO	519	131	154	34	42
BRESCIA	90	13	22	17	32
VERONA	102	8	11	9	12
VENEZIA	142	11	19	8	15
TRIESTE	125	13	13	12	12
GENOVA	379	71	75	23	25
BOLOGNA	178	16	16	10	10
FIRENZE	182	15	18	9	11
PERUGIA	70	6	8	9	13
ROMA	1152	138	240	14	26
FROSINONE	22	7	8	47	57
BARI	75	-37	-19	-33	-20
MESSINA	119	16	26	16	28
PALERMO	220	-4	20	-2	10
AOSTA	24	9	9	60	60
TRENTO	35	0	6	0	21
POTENZA	35	13	15	59	75
CATANZARO	20	-4	-3	-17	-13

Estate 2015: stima stagionale e confronto con 2012-2014

	Gennaio - Marzo			Giugno - Agosto		
Anno	Eccessi	Var. %	p_value	Eccessi	Var. %	p_value
2012	2412	9.5%	**<0.001**	336	1.5%	**0.025**
2013	882	3.6%	**<0.001**	122	0.6%	0.404
2014	148	0.6%	0.351	-1288	-5.9%	**<0.001**
2015	3319	13.0%	**<0.001**	2145	10.0%	**<0.001**

Quali sono i sottogruppi di popolazione a maggior rischio (suscettibili)?



Fattori che determinano la transizione dalla popolazione generale al "serbatoio" dei suscettibili

Determinanti della mortalità

Condizioni cliniche associabili agli effetti delle elevate temperature

Malattie cerebrovascolari

Malattie del sistema nervoso centrale

Disturbi psichici

Malattie cardiovascolari

Malattie apparato respiratorio

Insufficienza renale cronica

Malattie del fegato

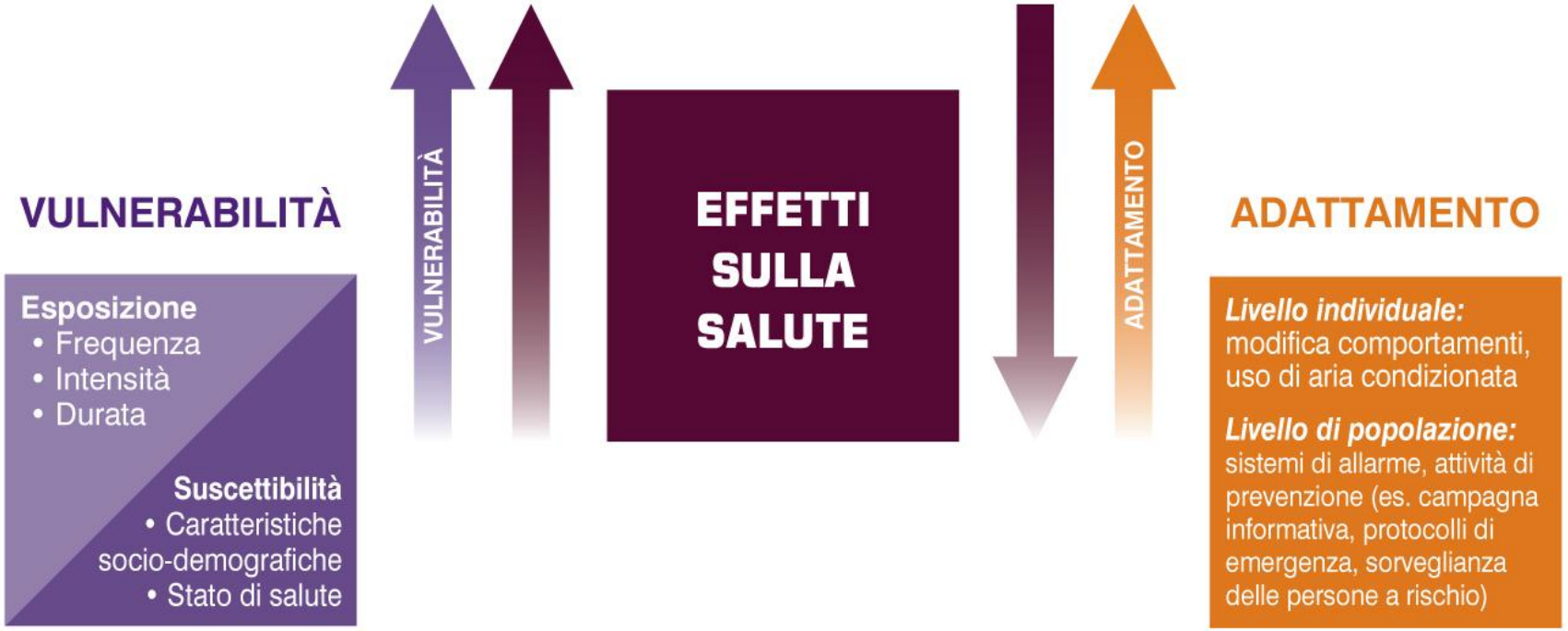
Malattie delle ghiandole endocrine e disturbi degli elettroliti

Uso di farmaci:

Interazione con la risposta fisiologica alle temperature elevate (es. neurolettici, ipnotici, antiparkinsoniani, diuretici)

Interazione con lo stato di idratazione (es. alcaloidi, antitrombotici etc.)

Vulnerabilità ed adattamento



LINEE DI INDIRIZZO PER LA PREVENZIONE DEGLI EFFETTI DEL CALDO SULLA SALUTE

Aggiornamento, Marzo 2013

2.1.5 L'identificazione dei sottogruppi di suscettibili

L'identificazione della popolazione suscettibile costituisce una fase preliminare importante di un piano di prevenzione perché consente di programmare interventi mirati in modo specifico ai sottogruppi di popolazione più a rischio contribuendo ad aumentarne l'efficacia e l'efficienza Nel paragrafo 1.2 vengono riassunti i principali

Piano Operativo Nazionale
Città con «anagrafe» degli anziani suscettibili al caldo

- ***Selezione da Sistemi Informativi 20 città***

- ***Segnalazione dei MMG, servizi sociali 7 città***

Piano Operativo Nazionale

«Anagrafe» degli anziani suscettibili al caldo

Procedura	Fonti dei dati	Caratteristiche	Frazione della popolazione della stessa fascia di età (range)
Selezione da Sistemi Informativi ***Indicatore di suscettibilità*** ***(20 città)***	**anagrafe** **SDO**	**età** **genere** **solitudine** **patologie** **SEP\Basso reddito**	**0.6 ÷ 39.2**
	prescrizioni farmaceutiche	**uso di Farmaci**	
	altri archivi (es. esenzioni)	**non autosufficienza**	
Segnalazione dei pazienti a rischio da MMG e operatori sociali ***(7 città)***	**In alcune città integrazione con archivi servizi territoriali**	**età** **genere** **solitudine** **patologie** **Basso reddito** **uso di Farmaci** **non autosufficienza**	**0.1 ÷ 19.3**

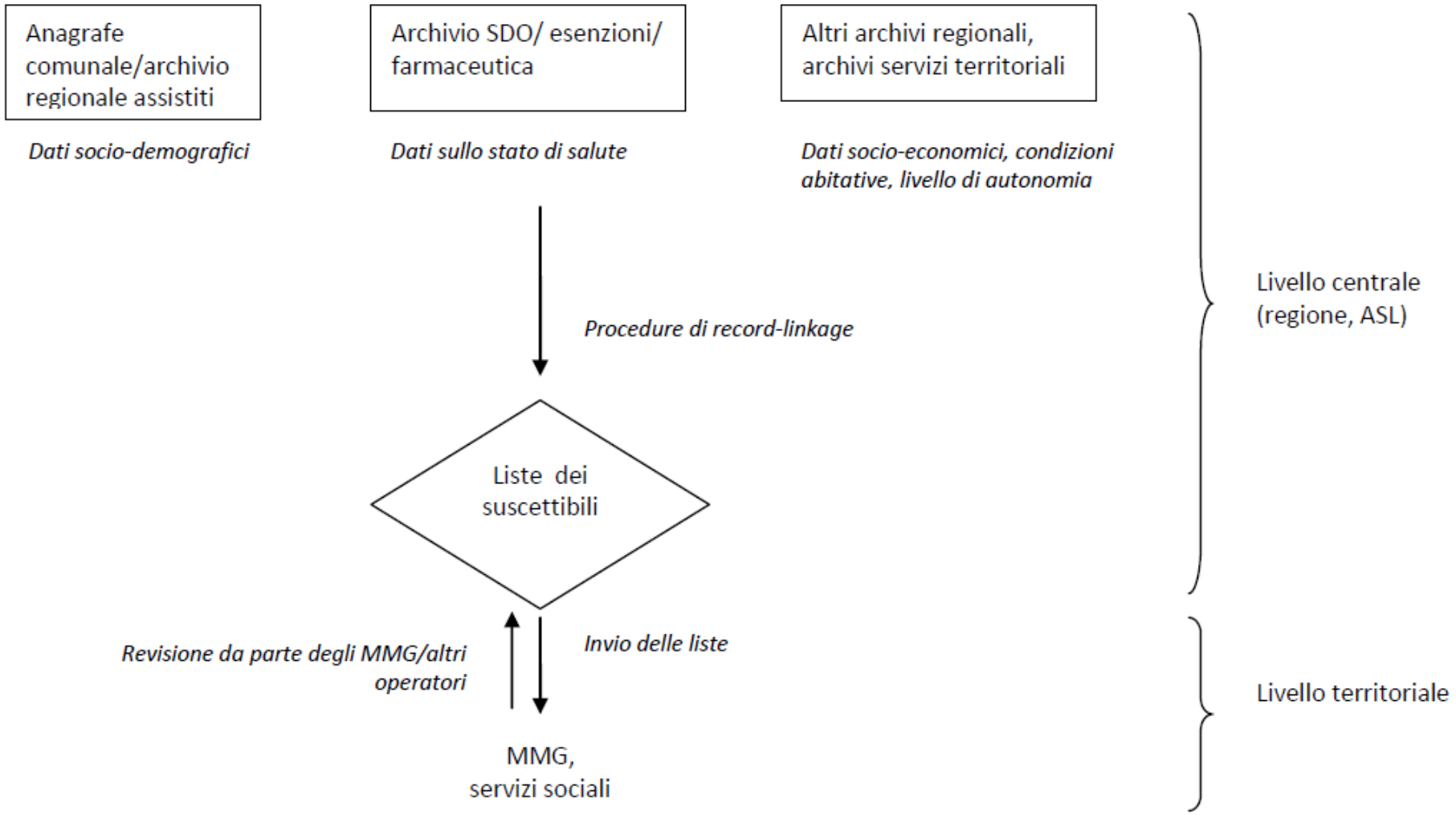
ESEMPIO: Indicatore di suscettibilità al caldo Regione Lazio

Obiettivo:

Definire, per ogni MMG, liste di pazienti suscettibili agli effetti delle ondate di calore attraverso la definizione di una procedura per la selezione dei sottogruppi a maggior rischio a partire dai sistemi informativi correnti:

- ***Anagrafe***
- ***SIO (due anni precedenti)***
- ***Indicatore Livello Socio Economico***
- ***Anagrafe Assistiti SSR***

ESEMPIO: Indicatore di suscettibilità al caldo Regione Lazio



ESEMPIO: Indicatore di suscettibilità al caldo Regione Lazio

Rischio di mortalità nei giorni di ondata di calore in diversi gruppi di score (decili della distribuzione)

Relative Score (RS)

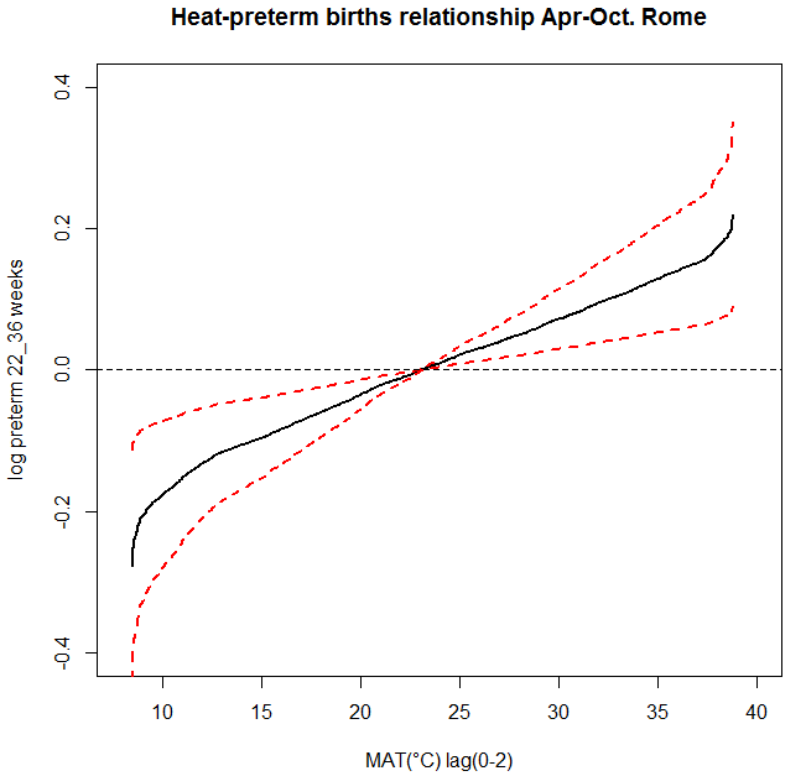
Class	RR	IC 95%	
		lower	upper
1	0.92	0.76	1.11
2	1.12	1.01	1.23
3	1.10	0.83	1.46
4	1.13	0.97	1.32
5	1.17	0.89	1.52
6	1.08	0.79	1.47
7	1.40	1.13	1.74

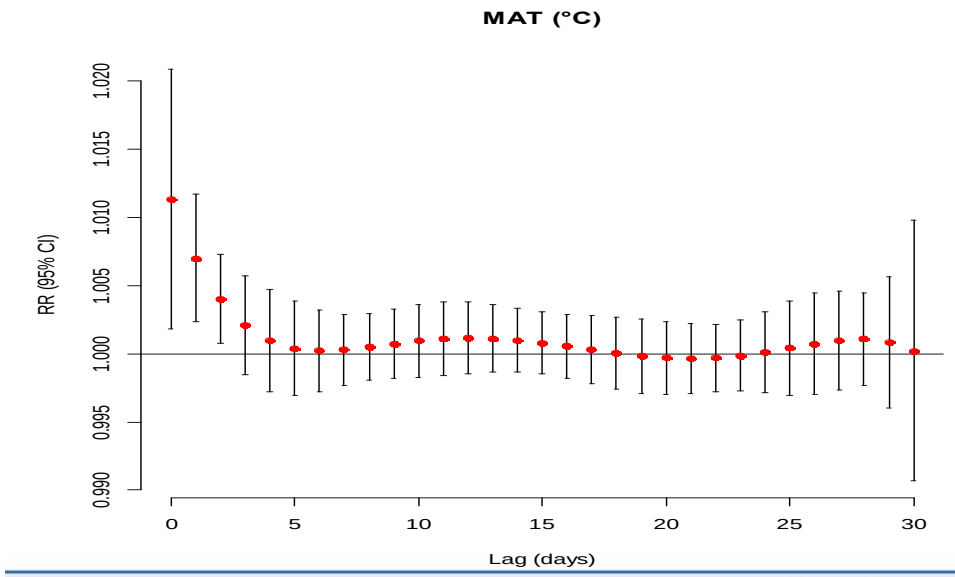
Schifano P, et al. Susceptibility to heat wave-related mortality: a follow-up study of a cohort of elderly in Rome Environmental Health 2009, 8:50. p.schifano@deplazio.it

Elevate temperature e rischio di nascita pretermine a Roma

- **Coorte di nati** in ospedali di Roma
  - Periodo 2001-2010 : **132,691 nati**

7,259 (5.5%) pretermine
(22°-36° settimana di gestazione)





SISTEMA SANITARIO REGIONALE

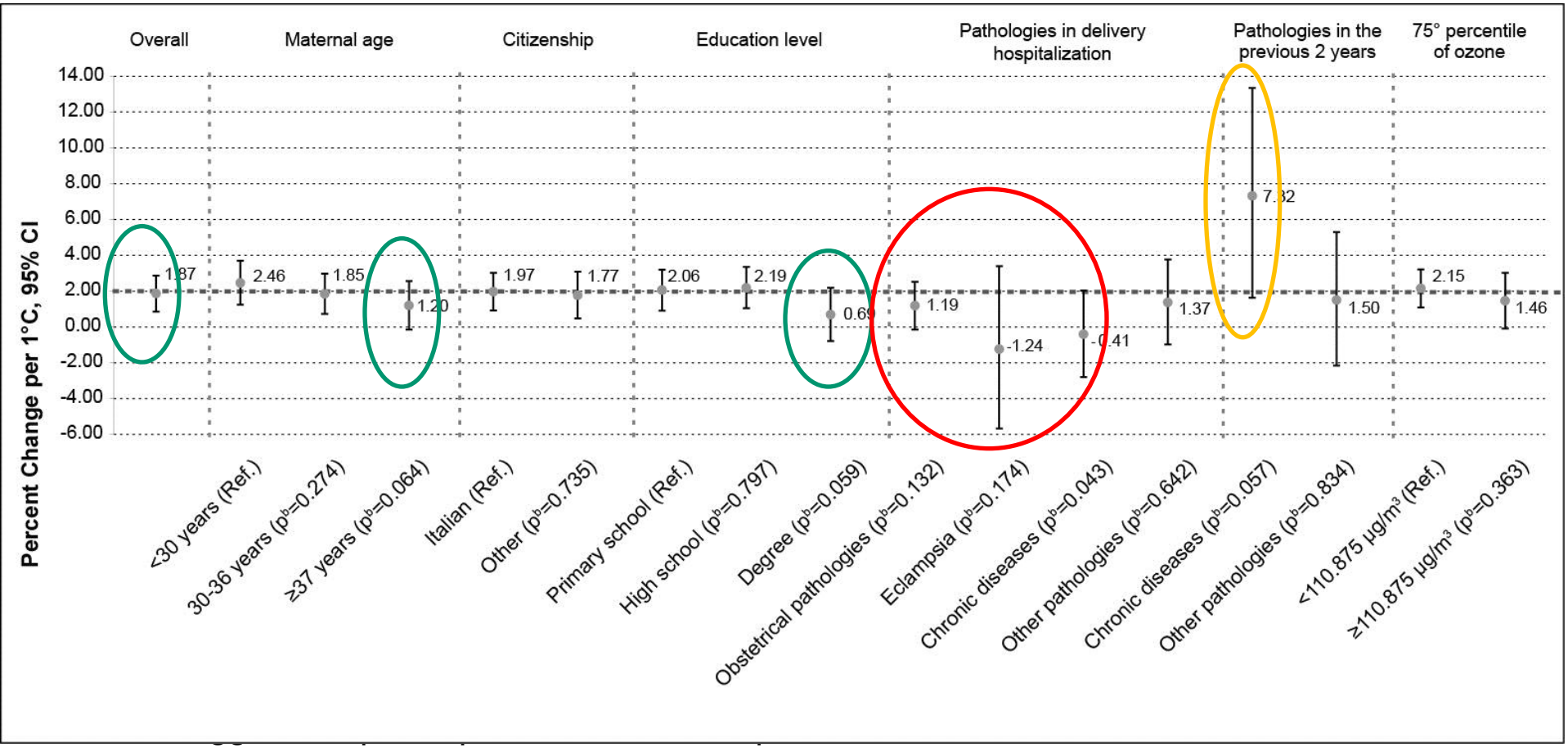
Schifano et al. Environ Int. 2013 Oct 5;61C:77-87

Effetto della temperatura (MAT) e del PM10 sul rischio di nascita pretermine nella stagione estiva

	Variazione % per incremento unitario di MAT e PM10 (IC 95%)	Variazione % per IQR di MAT e PM10 (IC 95%)
MAT (°C) (Lag 0-2)	1.87 (0.86, 2.87)	20.93 (9.37,33.72)
PM_{10} ($\mu g/m^3$) (Lag 12-22)	0.69 (0.23, 1.15)	7.30 (2.41, 12.42)

Schifano et al. Environ Int. 2013 Oct 5;61C:77-87

Modificazione dell'effetto delle alte temperature sul rischio di nascita pretermine



Variazione del rischio di nascita pretermine durante le ondate di calore per mese

	Variazione % (IC 95%)
Ondata di calore	19.21 (7.91, 31.69)
Per mese:	
Giugno	31.18 (6.36, 61.76)
Aprile-Maggio-Settembre-Ottobre	24.75 (8.49, 43.45)
Luglio-Agosto	3.14 (-14.46, 24.36)

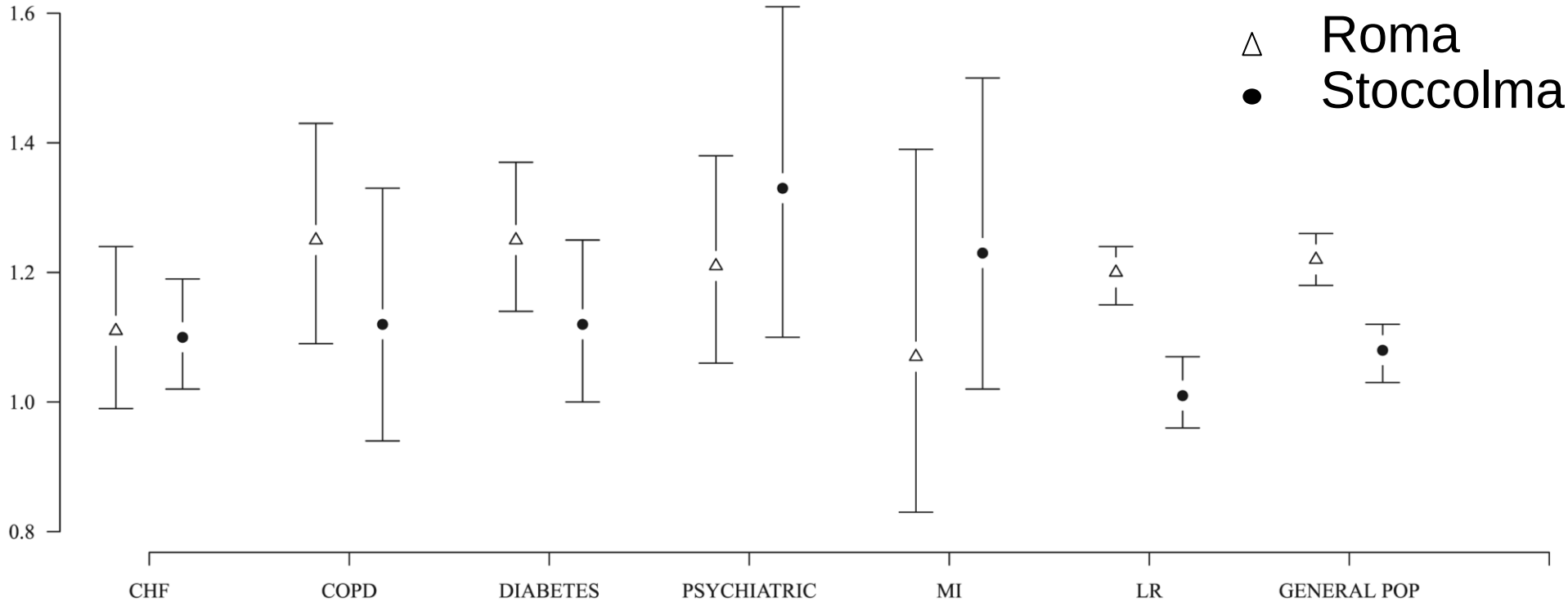
Schifano et al. Environ Int. 2013 Oct 5;61C:77-87

Estate sicura

Come vincere il caldo in gravidanza

Pochi e semplici consigli per un'**estate in salute** per la futura **mamma** ed il suo **bambino**

Effetto delle ondate di calore su sottogruppi di suscettibili di età 50+: uno studio di coorte a Roma e Stoccolma

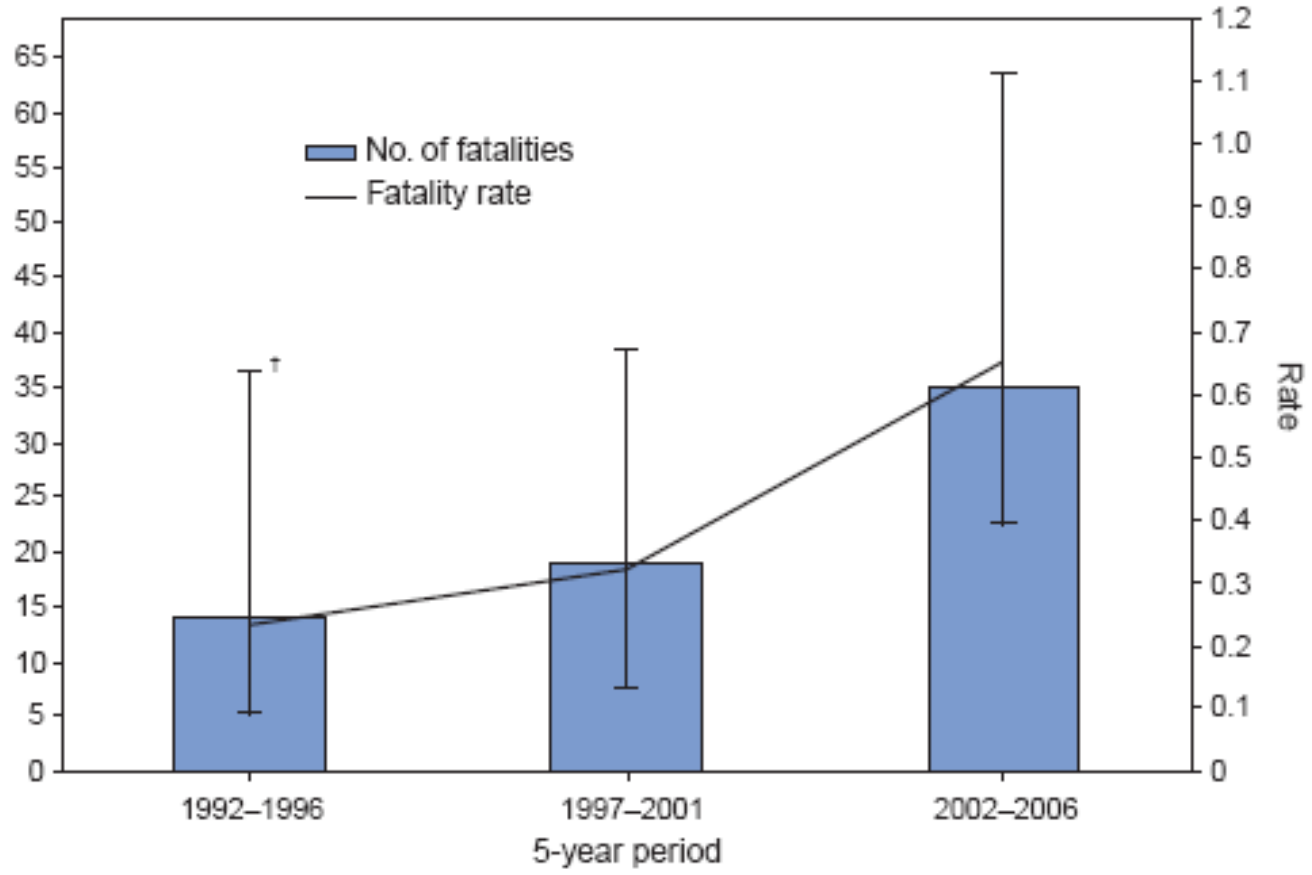


CHF-Scompenso cardiaco.
COPD-Broncopneumapatia cronico-ostruttiva.
MI-sopravvissuti all'infarto del miocardio.
LR sottogruppo a basso rischio

Daniel Oudin Åström, Environmental Health 2015

Effetti del caldo sui lavoratori nel settore dell'agricoltura

FIGURE. Number and rate* of heat-related deaths among crop workers, by 5-year period — United States, 1992–2006



* Per 100,000 workers. Rates calculated using annual national average estimates of employed civilians aged ≥15 years based on the Current Population Survey.

† 95% confidence interval for fatality rate.

BEAT THE HEAT:
Extreme Heat

Heat related deaths are preventable

WHAT:

Extreme heat or heat waves occur when the temperature reaches extremely high levels or when the combination of heat and humidity causes the air to become oppressive.

WHO:

More males than females are affected

Children

Older adults

Outside workers

WHERE:

Houses with little to no AC

Construction worksites

Cars

HOW to AVOID:

Stay hydrated with water, avoid sugary beverages

Stay cool in an air conditioned area

Wear light-weight, light colored, loose fitting clothes

During extreme heat the temperature in your car could be deadly!

Outside Temperature 80°

Inside 109°	Inside 118°	Inside 123°
Time Elapsed: 20 minutes	Time Elapsed: 40 minutes	Time Elapsed: 60 minutes

http://www.cdc.gov/

Health effects of heat

Two types of heat illness:

Heat Exhaustion

Heat Stroke

Watch out for early symptoms. You may need medical help.

People react differently — you may have just a few of these symptoms, or most of them.

1

Stay safe and healthy!

WATER. REST. SHADE. The work can't get done without them.

Drink water even if you aren't thirsty – every 15 minutes.

Rest in the shade.

https://www.osha.gov/

SISTEMA SANITARIO REGIONALE

ASL ROMA 1

REGIONE LAZIO

ORIGINAL ARTICLE

Extreme temperatures and emergency department admissions for childhood asthma in Brisbane, Australia

Zhiwei Xu,[1] Cunrui Huang,[2] Wenbiao Hu,[3] Lyle R Turner,[1] Hong Su,[4] Shilu Tong[1]

Research | Children's Health

A Section 508–conformant HTML version of this article is available at http://dx.doi.org/10.1289/ehp.1307960.

Ambient Heat and Sudden Infant Death: A Case-Crossover Study Spanning 30 Years in Montreal, Canada

Nathalie Auger,[1,2,3] William D. Fraser,[2,4] Audrey Smargiassi,[1,5] and Tom Kosatsky[6]

[1]Institut national de santé publique du Québec, Montreal, Quebec, Canada; [2]University of Montreal Hospital Research Centre, Montreal, Quebec, Canada; [3]Department of Social and Preventive Medicine, University of Montreal, Montreal, Quebec, Canada; [4]Department of Obstetrics and Gynecology, University of Sherbrooke, Sherbrooke, Quebec, Canada; [5]Department of Occupational and Environmental Health, University of Montreal, Montreal, Quebec, Canada; [6]British Columbia Centre for Disease Control, Vancouver, British Columbia, Canada

OPEN

Assessment of the temperature effect on childhood diarrhea using satellite imagery

SUBJECT AREAS:
RISK FACTORS
DIARRHOEA

Received
19 December 2013

Accepted
28 May 2014

Zhiwei Xu[1], Yang Liu[2], Zongwei Ma[2], Ghasem (Sam) Toloo[1], Wenbiao Hu[1] & Shilu Tong[1]

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ROMA 1
REGIONE LAZIO

KEEPING KIDS SAFE FROM THE SUMMER H

austin moms blog

NINE EASY TIPS

Apply sunscreen early & often

Look for sunscreen that is "broad spectrum", protecting from UVA and UVB rays. Opt for at least SPF 15, and be sure to apply 30 minutes before going outside and then every two hours when in the sun.

Keep new babies out of the sun

Babies under 6 months get hot quickly AND can't wear sunscreen, so keep them inside or in the shade. Dress them in lightweight pants and long-sleeves if possible for even more protection.

Protect their heac & face with a hat

Hats can keep the scalp from getting burned, and protect the fa and ears. While baseball caps ar popular, they don't protect ears a necks as well as wide-brimmed ha (which are also adorable).

Protect those pretty little eyes, too

Kid eyes haven't matured to filter UV rays effectively, so the average kid takes in 3x times the UV exposure of adults! Sunglasses (the kind with UV protection, not the toy kinds) can help protect those lookers and be awfully cute at the same time.

Loose, light clothing is best

Make sure to dress the little ones in cool, comfortable clothing. Light-colored cotton is the best option, and will allow sweat to evaporate. Another great option is UV clothing, which can have up to a 50 SPF!

Limit sun exposu at peak times

On those super hot days, try t avoid outside playtime during t hottest times of the day (usua 11am - 3pm). Come inside in t AC, or find a nice shaded spot take it easy in.

Never leave kiddos in the car!

Over the last 20 years, more than 600 kids have died as a result of being left in hot cars. Even just a few minutes can be deadly, as temps rise quickly and kids are more susceptible to heatstroke. Never leave kids in the car even for a moment, and make it routine to check the backseat before walking away!

Hydrate, hydrate, hydrate

Keep those kiddos hydrated! Avoid caffeinated drinks like soda and tea, or sugary juices and sports drinks, which can actually have a diuretic affect. Water is the best for hydrating, but coconut water and even milk are good options too.

Watch for signs heat illness

Learn the signs of heat exhau and heat stroke (which is su dangerous!). Be on the looko weakness, fainting, lack of sv cramping, nausea, headaches sudden high temps...and if symptoms are severe get emer help ASAP.

austin moms blog

DATA SOURCES: http://www.wsj.com/articles/eye-protection-from-the-sun-especially-important-for-kids-1404250860 http://www.webmd.com/parenting/features/hot-cars-and-child-death-prevention

TIPS AND TRICKS

how to stay safe in the sun!

SUN SAFETY facts

FACTS on sun safety

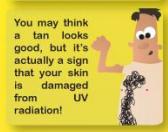
Women are around two times as likely to apply sunscreen as men

The sun can even effect your eyes! By exposing your eyes to UV radiation you can get temporary injuries such as photokeratits and photoconjunctvitis- where you're burning the skin-like tissues in your eye & eyelid.

The sun radiates light to the earth. Different types of light are produced; such as infrared light, colour light, and ultraviolet light.

UVA: These types of rays cause skin aging, wrinkling, and contribute to skin cancer.
UVB: This type of ray is also dangerous; they cause sun-burns, cateracts, and they effect a person's immune system.

Being exposed to UVB radiation triggers the body to produce vitamin D_3 for the body!



You may think a tan looks good, but it's actually a sign that your skin is damaged from UV radiation!

Bet you didn't know this...
Wearing perfume in the sun can be dangerous. The heat can chemically change some of the ingredients- which can cause allergic rashes and age spots!

The higher the sun is in the sky, the more intense the suns rays are.

Even snow can contribute to burns!
The light colour of snow reflects the sun's UV rays- harming our skin even in the cold!

95% of UVA rays reach the earth

5% of UVB rays reach the earth

A double sided fact
Too much sun exposure has been proven to cause skin cancers and other negative impacts on the bodies immune system; although limited amounts have been proven to treat diseases too!

UV radiation can be produced by artifical means, such as tanning beds. This type of exposure is just as dangerous as the radiation from the sun.

The sun is strongest between 11 AM and 4 PM.

TIPS on staying safe in the sun

Don't wait for your skin to tell you when to get out of the sun- if you're burnt tnt you're skin is already badly damaged.

Wear sunscreen with an SPF 15 or higher. The larger the SPF number- the better and more protected you are!

Use sunglasses that have 100% UV protection!

Try playing in the sun early in the morning or late afternoon rather then noon.

Don't spend more then 30-60 minutes in the sun near noon. Too much sun exposure can lead to sunburns, skin aging skin cancer and more.

After being out in the sun, apply vitamin E to your skin. It helps prevent age spots!

BE SUN SMART!
follow these 5 simple steps to be safe while in the sun!
1. Wear Sunglasses
2. Use LOTS of sunscreen
3. Wear a hat
4. Cover up
5. Find Shade

Children need extra protection from the sun. If you're under 18 and have had many sunburns you increase the chance of getting skin cancer.

Wear protective clothing while spending a lot of time out in the sun, such as hats, sunglasses, and coverups.

Try and avoid being out in the sun from 11 AM until 4 PM, this is when the sun is the strongest!

While in the sun, drink LOTS of water to stay hydrated!

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Sun Safety for your kids

Did you know?
The sun projects harmful UVA and UVB rays that can lead to future health issues for you and your children.

UVA: higher risks of cancer and premature skin aging.

UVB: causes sun burns and increases further risk of skin cancer.

Did you know?
Despite what most people believe harmful UVA rays can penetrate clouds so you and your children are still at risk on cool cloudy days during the summer!

Did you know?
Sunglasses not only protect your eyes from the bright light but also from harmful UVA rays that can lead to: cataracts, age-related macular degeneration (AMD) as well as protect the skin around the eyes from premature ageing.

Did you know?
Not all Sunglasses protect from UVA rays and darker doesn't mean more protection!

Did you know?
Sun cream comes with a SPF protection rating ranging from 5 (low) to 50 (full protection) Sun cream can take up to 30 min to sink into the skin and should be applied every 2-3 hours for maximum all day protection.

Did you know?
Although it is recommended to use a minimum of factor 30 if a child has fair skin and hair or has lots of exposed moles it's a good idea to use factor 50 for extra protection.

Did you know?
Babies under the age of 6 months should not use sun creams! So it's important to keep them in shade.