

# Introducción a la estadística y teoría de probabilidades

Por Netzahualpilli Delgado Figueroa

# Bibliografía sugerida:

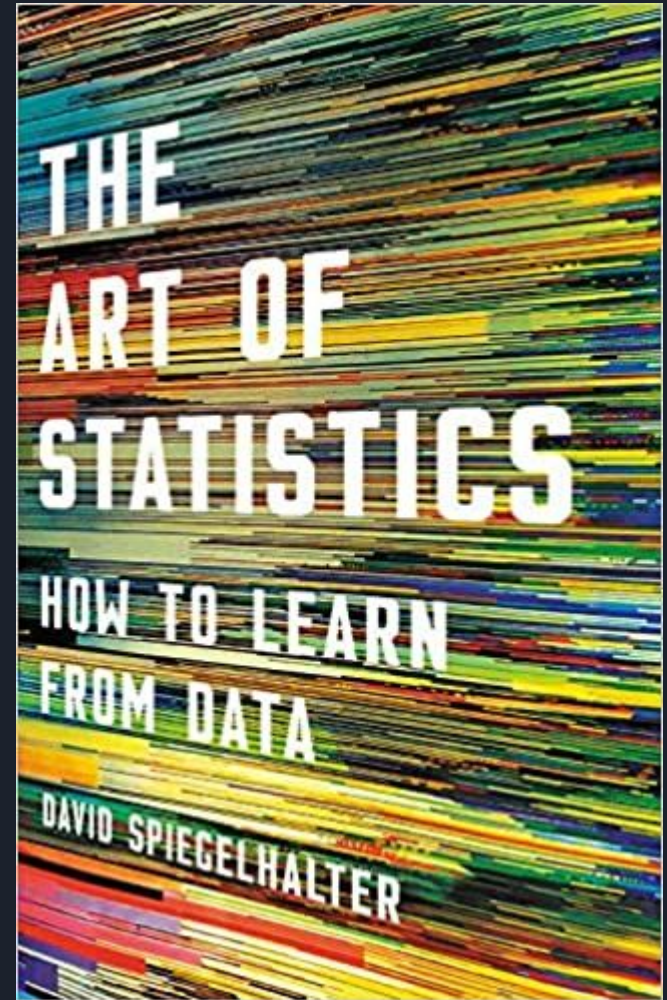
The Art of Statistics

How to Learn from Data

David Spiegelhalter

Hachette Book Group, Inc. 2019

ISBN: 978-1-5416-1851-0

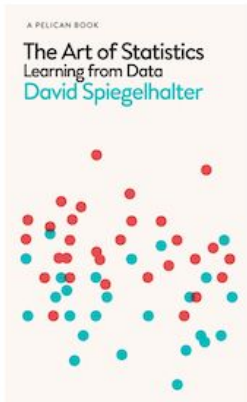


# Repositorios de datos del libro:

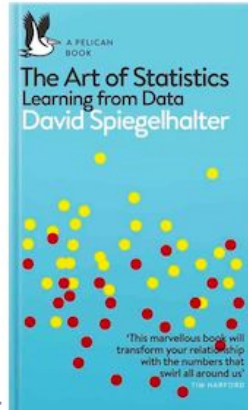
<https://github.com/dspiegel29/>

README.md

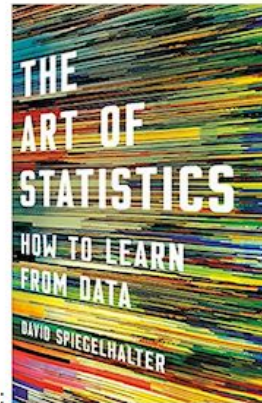
## The Art of Statistics: Code, Data, Errata and Additions



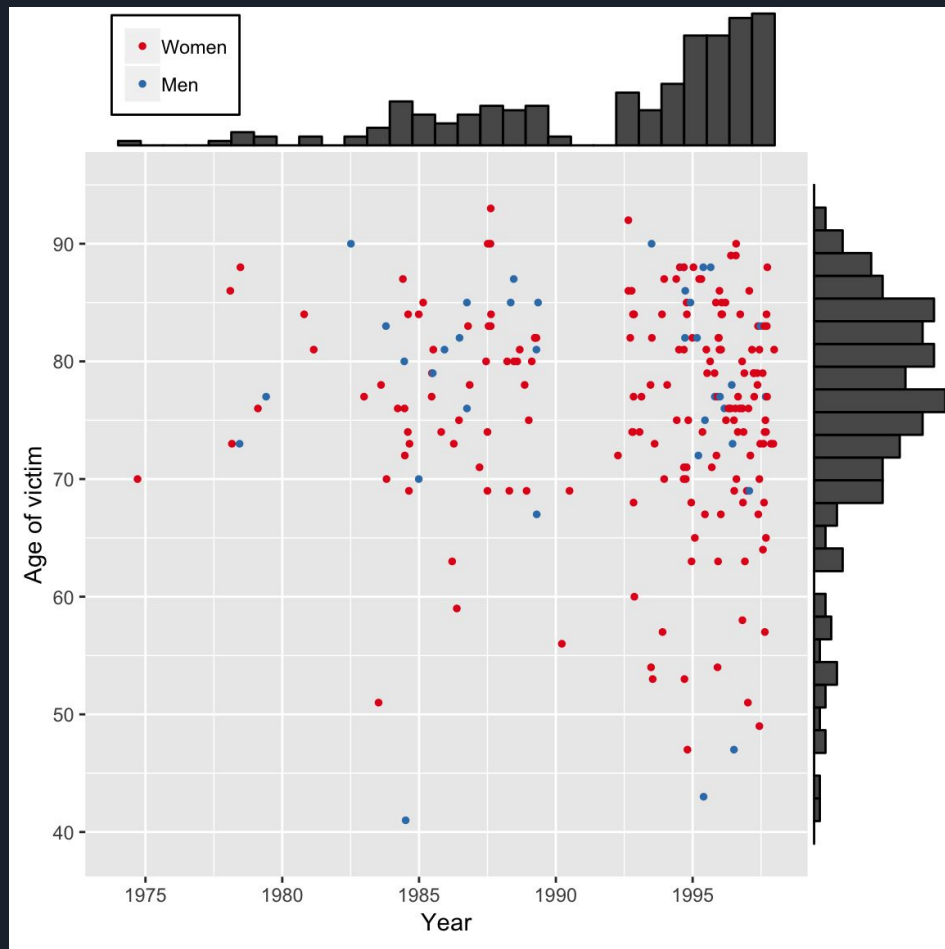
UK hardback:



UK paperback:

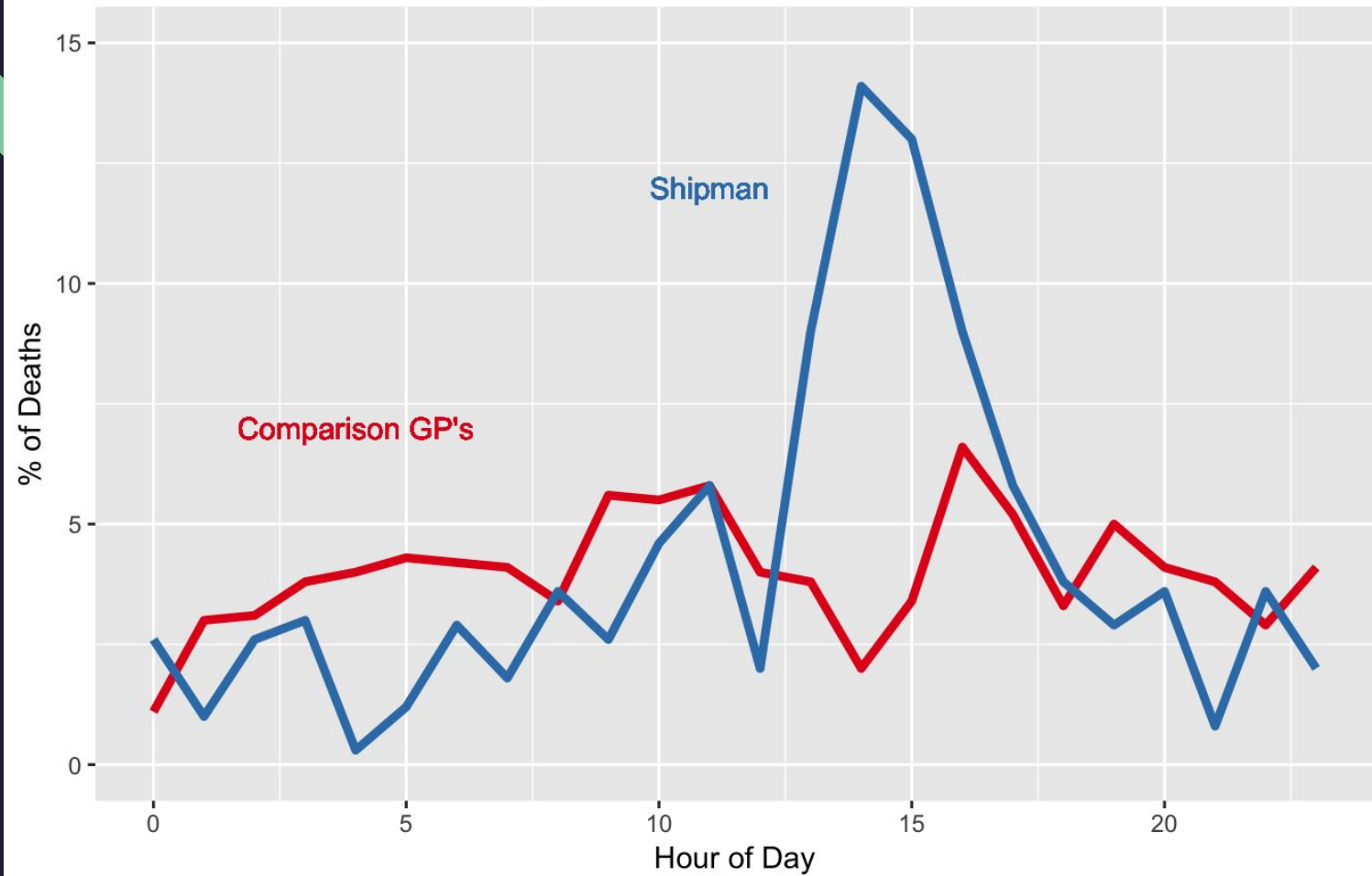


US hardback:



# Deaths by Hour of Day

From Shipman dataset



# Introducción a los datos:

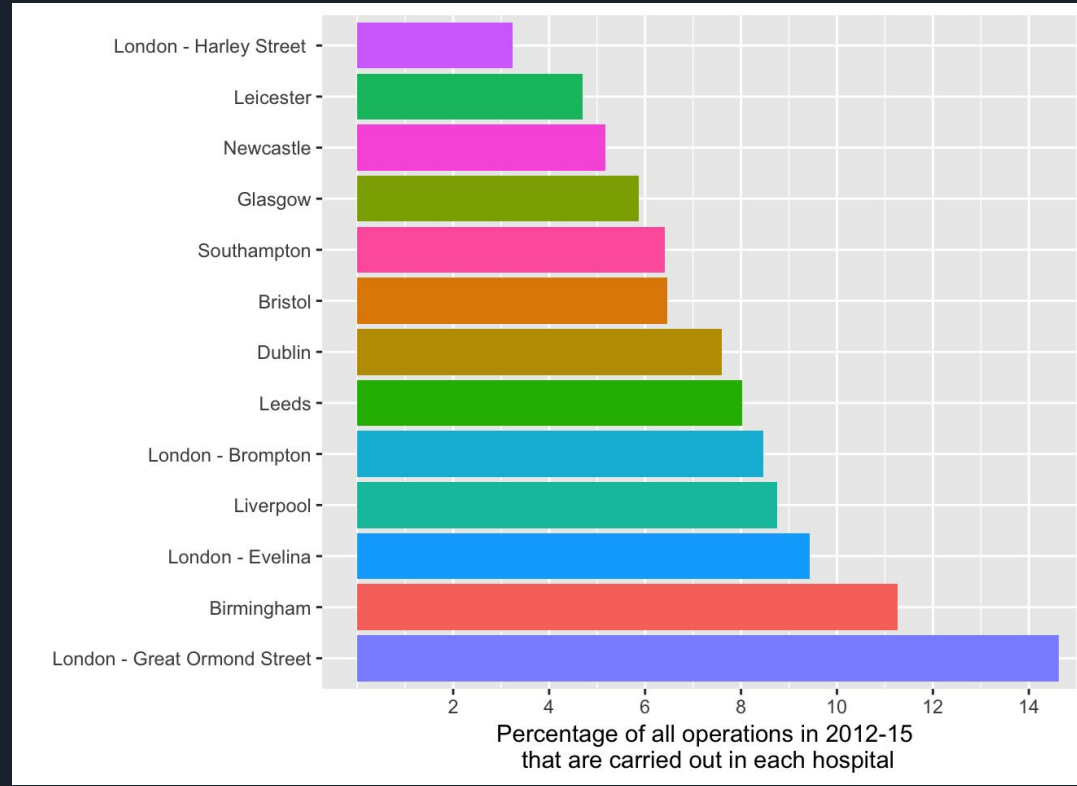
Binarios: Si y No

(Pueden representarse por el número de eventos  
# y %)

Número de eventos de una enfermedad

Número de operaciones

Número de muertos



# Uso de datos de COVID-19 en México

<https://datos.covid-19.conacyt.mx/>



## Información General

Nacional

Fuente: DGE



opciones de vista

CONFIRMADOS

8,261



NEGATIVOS

31,170



SOSPECHOSOS

10,139



DEFUNCIONES

686



CASOS POR SEXO

57.97 %



42.03 %



CASOS HOSPITALIZADOS / AMBULATORIOS

36.91 %

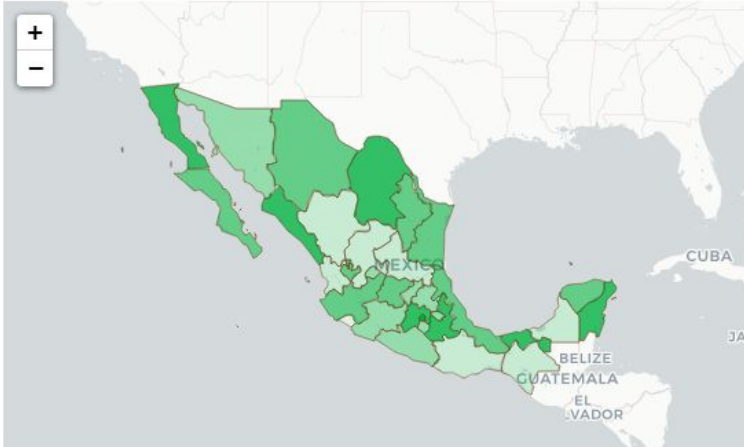


63.09 %



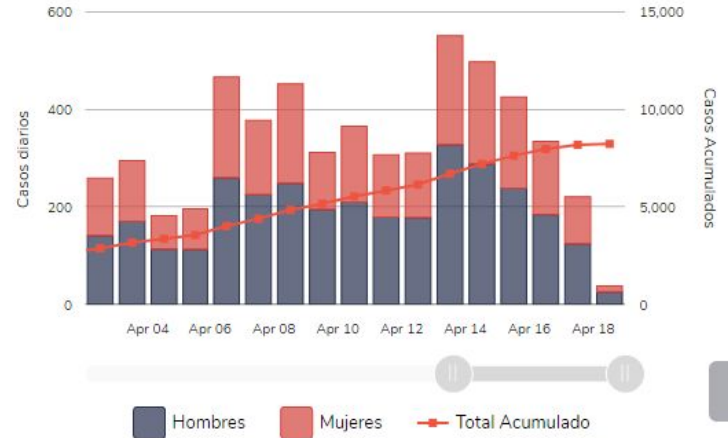
### Mapa de Casos Confirmados

(Seleccione una unidad ↓ o una vista →)



### Gráfica de Casos Confirmados

(Casos diarios por género y acumulados)







# Información General

Jalisco

\*Actualizado: 19-04-2020

Fuente: DGE



opciones de vista

CONFIRMADOS

198



NEGATIVOS

2,805



SOSPECHOSOS

372



DEFUNCIONES

13



CASOS POR SEXO

58.59 %



41.41 %



CASOS HOSPITALIZADOS / AMBULATORIOS

21.21 %

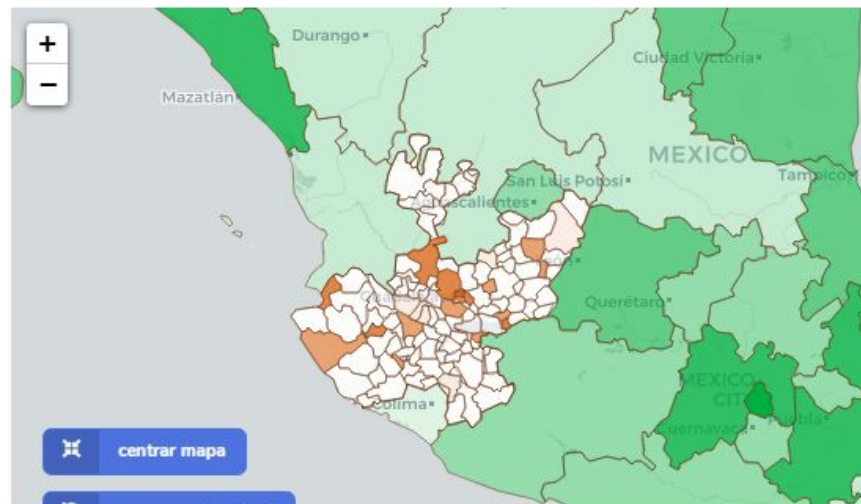


78.79 %



## Mapa de Casos Confirmados

(Seleccione una unidad ↓ o una vista →)

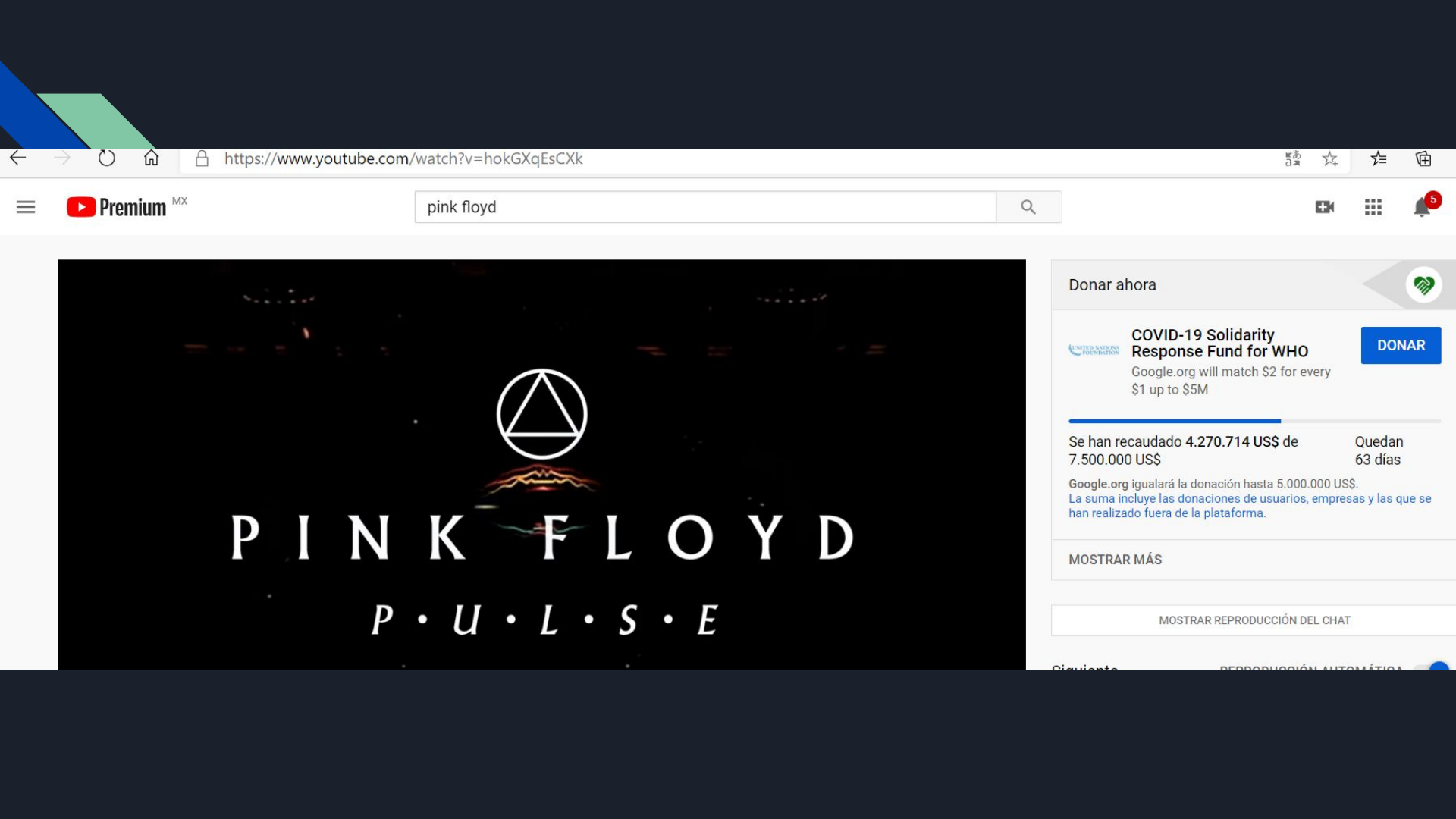


## Gráfica de Casos Confirmados

(Casos diarios por género y acumulados)







PINK FLOYD  
P • U • L • S • E

Donar ahora

**COVID-19 Solidarity Response Fund for WHO**  
Google.org will match \$2 for every \$1 up to \$5M

DONAR

Se han recaudado 4.270.714 US\$ de 7.500.000 US\$  
Quedan 63 días

Google.org igualará la donación hasta 5.000.000 US\$.  
La suma incluye las donaciones de usuarios, empresas y las que se han realizado fuera de la plataforma.

MOSTRAR MÁS

MOSTRAR REPRODUCCIÓN DEL CHAT

# OpenWHO.org

Celebrating 2 million course enrolments!



Filter courses by: Channel ▾ Language ▾ Proficiency Level ▾ Keyword ▾

Search



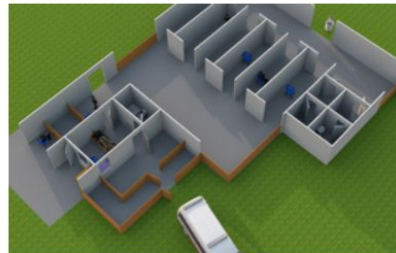
**Standard precautions: Hand hygiene**



**COVID-19: How to put on and remove personal protective equipment (PPE)**



**Introduction to Go.Data – Field data collection, chains of transmission and contact...**



**Projeto de Unidade de Tratamento de Síndrome Respiratória Aguda Grave...**

# Clinical Care Severe Acute Respiratory Infection

Course is available

Learnings

Discussions

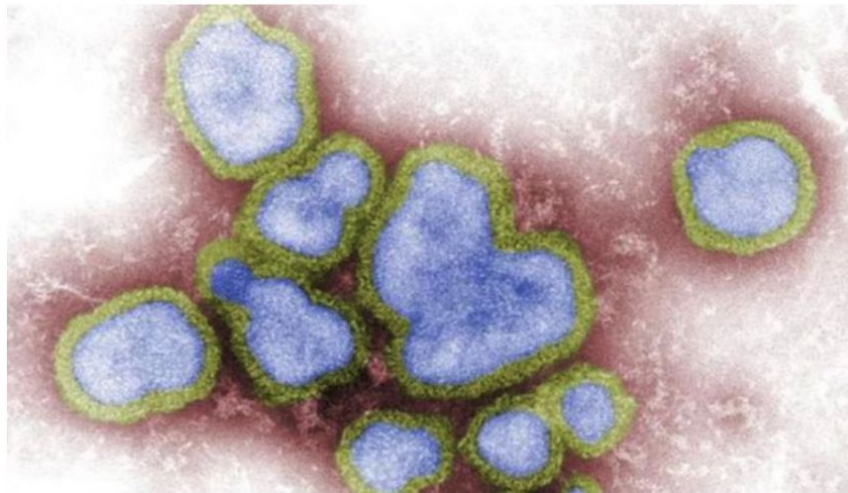
Progress

Collab Space

Course Details

Documents

Announcements



share

tweet

share

mail

Welcome to the Clinical Care Training for Severe Acute Respiratory Infection (SARI).

Self-paced

Language: English

COVID-19

>>Enroll me for this course

Course information

Enroll me for this course

Helpdesk



[Catalog](#) ▸ [Health & Safety Courses](#)

## Mechanical Ventilation for COVID-19

This course will provide licensed medical professionals with an understanding of mechanical ventilation so they can support the critical care team caring for patients receiving mechanical ventilation during the COVID-19 pandemic.



161,004 already enrolled!

**Enroll**

Starts Apr 27

☐ I would like to receive email from HarvardX and learn about other offerings related to Mechanical Ventilation for COVID-19.



## About this course

This course will help prepare licensed non-ICU hospital clinicians to support critical

🕒 Length: 1 Weeks

🕒 Effort: 2–5 hours per week

Catalog > Medicine Courses

# Viruses & How to Beat Them: Cells, Immunity, Vaccines

Learn how our immune system fights viral disease and make better vaccination decisions with a clearer understanding of Cells, Viruses, and Immunity.



23,116 already enrolled!

**Enroll**  
Starts Apr 27

☐ I would like to receive email from IsraelX, TelAvivUniversity and learn about other offerings related to Viruses & How to Beat Them: Cells, Immunity, Vaccines.

## About this course

Have you ever wondered what viruses actually are?

Have you been curious about the ways they invade our bodies, attack our cells and make us sick? Come and learn what viruses are made of and understand the mechanisms of how they hijack and take over our cells.

🕒 Length:	7 Weeks
🕒 Effort:	2–3 hours per week
💰 Price:	FREE Add a Verified Certificate for



We're here to help you stay connected and move forward, together. **Read about our response to COVID-19.** <https://www.edx.org/covid-19>



Courses ▾ Programs & Degrees ▾ Schools & Partners edX for Business

🔍 Sign In

Register

Catalog > Medicine Courses

## Covid - 19: Ventilación mecánica para no intensivistas

Aborda aspectos relacionados con las medidas de protección y bioseguridad, intubación orotraqueal, ventilación mecánica, Síndrome de Dificultad Aguda Respiratoria en el marco de la contingencia actual mundial por el coronavirus.

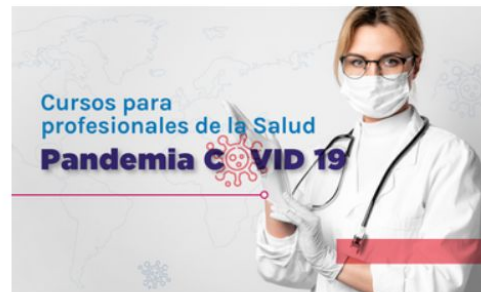


20,056 already enrolled!

**Enroll**

Starts Apr 27

☐ I would like to receive email from JaverianaX and learn about other offerings related to Covid - 19: Ventilación mecánica para no intensivistas.



### About this course

🕒 Length:

2 Weeks

## Covid-19 treatment

Courses directly related to diagnosing and treating Coronavirus.



**Introduction to coronavirus disease 2019 (COVID-19)**



**Guideline focus: COVID-19 rapid guideline on critical care (NICE)**



**Infection control - including basic personal protective equipment**



**Airways management: tracheal intubation**

## Covid-19 treatment

Courses directly related to diagnosing and treating Coronavirus.





health

Food Fitness Wellness Parenting Vital Signs

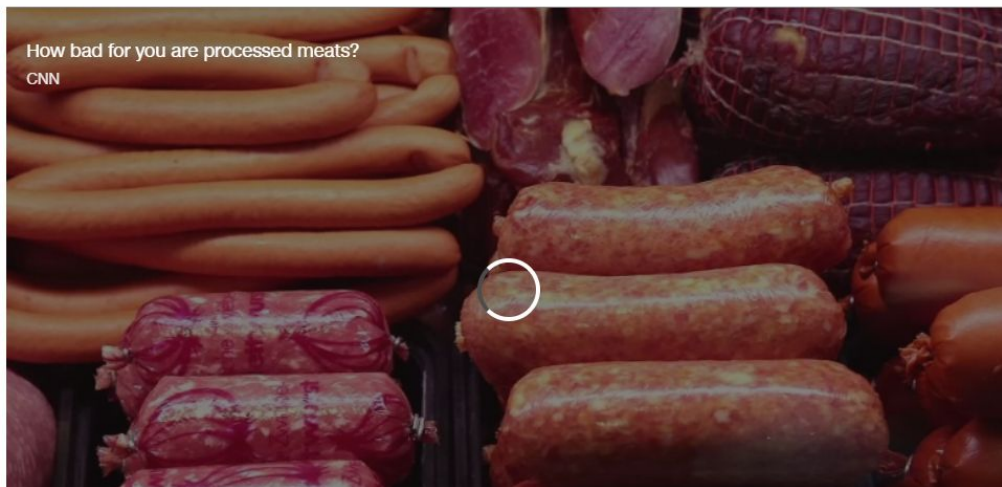
Edition ▾



# Eating just one slice of bacon a day linked to higher risk of colorectal cancer, says study

By Nina Avramova, CNN

🕒 Updated 1358 GMT (2158 HKT) April 17, 2019



How bad for you are processed meats?

CNN

## News & buzz



Trump goes into hiding



Chris Cuomo on Covid-19  
Recovery: Dr. Sanjay Gupta's  
coronavirus...

NEWS | [VOLUME 16, ISSUE 16, P1599-1600, DECEMBER 01, 2015](#)



Subscribe

Search

# Carcinogenicity of consumption of red and processed meat

Véronique Bouvard • Dana Loomis • Kathryn Z Guyton • Yann Grosse • Fatiha El Ghissassi • Lamia Benbrahim-Tallaa • et al. [Show all authors](#)

Published: October 26, 2015 • DOI: [https://doi.org/10.1016/S1470-2045\(15\)00444-1](https://doi.org/10.1016/S1470-2045(15)00444-1)

References

Article Info

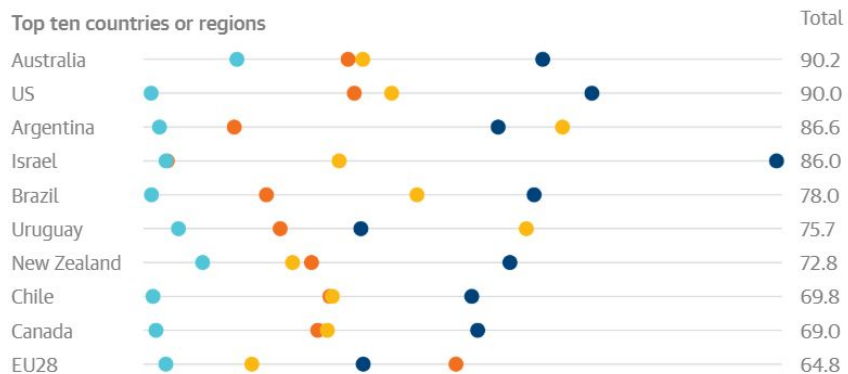
In October, 2015, 22 scientists from ten countries met at the International Agency for Research on Cancer (IARC) in Lyon, France, to evaluate the carcinogenicity of the consumption of red meat and processed meat. These assessments will be published in volume 114 of the IARC Monographs. <sup>1</sup>

## Meat consumption

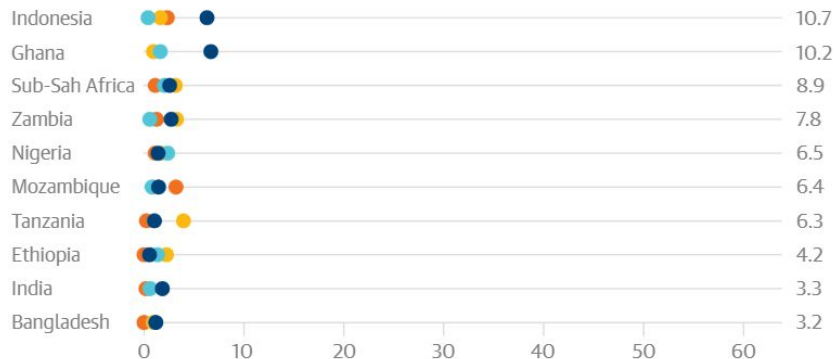
Kg per capita, 2014

Pork | Sheep | Beef/veal | Poultry

Top ten countries or regions



Bottom ten



## Carcinogenicity of consumption of red and processed meat

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Published: October 26, 2015 • DOI: [https://doi.org/10.1016/S1470-2045\(15\)00444-1](https://doi.org/10.1016/S1470-2045(15)00444-1)

No consumen tocino	Consumen tocino diario
6% (CÁNCER DE COLON)	7%
6 de cada 100	7 de cada 100
1 en 16	1 en 14
ODDS : $6/94 (=100) = 0.06$	ODDS: $7/93 = 0.07$
$RR = (7/93) / (6/94) = 1.18 = RR \ 1.18 = +18\%$	



## Carcinogenicity of consumption of red and processed meat

Véronique Bouvard • Dana Loomis • Kathryn Z Guyton • Yann Grosse • Fatiha El Ghissassi • Lamia Benbrahim-Tallaa • et al. [Show all authors](#)

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RIESGO RELATIVO: (PRESENTE EN GRUPOS)

18% DE AUMENTO DE CÁNCER COLORRECTAL (PROPORCIÓN)

RIESGO ABSOLUTO: (AJUSTADO A LA PREVALENCIA DEL EVENTO)

1:100 - 1:1,000 - 1:100,000 (TASA)

OR (ODDS RATIO)

RR (RIESGO RELATIVO) RELATIVE RISK

Preparedness	Odds		Odds				
			Odds	Preparedness is about being prepared no matter the odds, because eventually it will happen. Below are the different odds of various events that could happen to anybody. Some of them you can prepare for and others you just have to hope they don't occur in your lifetime.			
			Winning the U.S. Lotto 1:292,000,000	Being Dealt a Royal Flush 1:649,740	Being Killed by a Shark 1:8,000,000	Hit by Satellite Debris 1:21,000,000,000,000	Slipping in the Shower 1:2,232
			Being Murdered 1:18,000	Win an Academy Award 1:11,500	Meteor Hitting Your House 1:182,138,880,000,000	Dying From Any Injury 1:1,820	Dying from Assault 1:16,421

Prepping Introduction	Odds		Dying from a Fall 1:20,666	Struck By Lightning 1:576,000	Killed by Asteroid 1:74,817,414	Death via Legal Execution 1:127,717	Injury from Fireworks 1:19,556
			Being Killed Next Year 1:69	Killed By Lightning 1:576,000	Becoming President 1:10,000,000	Dying in Airplane Accident 1:354,319	Dying From Self Harm 1:9,380
			Dying from Car Accident 1:18,585	Dying in an Explosion 1:107,787	Earth Asteroid Collision Within 100 Years 1:5,000	Dying from Exposure to Forces of Nature 1:225,107	Dying From Food Poisoning 1:3,000,000
	Odds		Dying from Venomous Animal 1:3,441,325	Having a Stroke 1:6	Getting a Flat Tyre 1:5 / Year	God Existing 2:3 (Calculated by a Scientist)	Dying from Heart Disease 1:3
			Being Assaulted 1:60 / Year	Being In A Car Accident 1:18 / Year	Car Broken Into/Stolen 1:150 / Year	Assaulted with Weapon 1:277 / Year	Getting Mugged 1:500 / Year
			Getting Breast Cancer 1:9	House Burglary 1:38 / Year	Developing Cancer 1:2	A Household Fire 1:5 / Year	Solar Flare (Carrington Sized) 1:8.3 / 10 Years
			Tornado Destroys House 1:10,000,000 / Year	Hurricane Hits Miami 1:25 / Year	Dating a Millionaire 1:216	Getting a Hole in One 1:5,000	Being an Astronaut 1:13,200,000



OR 1.23 = 23% MAYOR PROBABILIDAD DE QUE  
OCURRA

OR 0.74 = -26% DE PROBABILIDAD DE QUE OCURRA  
EL EVENTO

OR 3.17 = +217 % de probabilidad (x2 el evento)  
=100% = 1 vez más que ocurra el evento



## Table 3 OR estimates between various smoking-related variables (categorical) and lung cancer risk

From: [Risk of lung cancer in relation to various metrics of smoking history: a case-control study in Montreal](#)

Model	Cigarette smoking variables <sup>a</sup>	Unit or category	OR <sup>b</sup> [95% CI]	DF	AIC	
Among men						
Among all subjects (non-smokers being the reference group) - [N = 1,630 for men]						
a	Ever smoking	No	1	-	24	1907
		Yes	7.82	[4.59 - 13.30]		
b	Smoking status	Non-smoker	1	-	25	1796
		Ex-smoker	3.99	[2.31 - 6.87]		
		Current smoker	14.93	[8.66 - 25.73]		
c	Duration of smoking	0	1	-	28	1747
		]0-20]	1.23	[0.60 - 2.51]		



$7.82 - 1 = 682\%$  ADICIONAL DE PROBABILIDAD (CASI 7  
VECES [x7])



Epistemonikos

febrero 2018

## Vitamina C como tratamiento para el resfrío común

### Detalles de la pregunta

**Participantes:** Población general

**Intervenciones:** Ingesta de vitamina C desde el primer día de resfrío

**Comparación:** Placebo o no uso de vitamina C

**Fuente:** 4 revisiones sistemáticas y 7 estudios primarios

Frases en lenguaje sencillo ☒

Efecto absoluto ☒

Efecto relativo ☒

Panorámica visual ☐



Desenlaces

Frases en lenguaje sencillo

Efecto absoluto

Sin  
Vitamina C

Con  
Vitamina C

Efecto relativo

(IC 95%)  
Nº de participantes y estudios

Certeza de la  
Evidencia  
GRADE

### Duración del resfrío

*La vitamina C tiene poco o nulo impacto en la diferencia en la duración del resfrío.*

5.8<sup>i</sup>  
días

5.63<sup>i</sup>  
días



Diferencia promedio: 0.17 días  
menos  
(IC 95%: 0.48 menos a 0.14 más)

MD -0,17  
(-0,48 a 0,14)

Basado en datos de 3249  
pacientes en 5 estudios

++++  
Alta  
.....

### Días sin salir de casa o sin ir a trabajar

*La vitamina C tiene poco o nulo impacto en la diferencia en los días en casa o sin trabajar.*

0.88<sup>i</sup>  
días

0.8<sup>i</sup>  
días



Diferencia promedio: 0.08 días  
menos  
(IC 95%: 0.18 menos a 0.09 más)

Basado en datos de 2569  
pacientes en 3 estudios

++++  
Alta  
.....

Epistemonikos

noviembre 2016

## Probióticos para prevenir la diarrea del viajero

**Detalles de la pregunta**

**Participantes:** Viajeros  
**Intervenciones:** Probióticos  
**Comparación:** Placebo

**Fuente :** Epistemonikos

Tabla

Mensaje principal

Frases en lenguaje sencillo OFF

Efecto absoluto ON

Efecto relativo ON

Panorámica visual ON

Desenlaces	<b>Efecto absoluto</b> Sin Probióticos      Con Probióticos	<b>Diferencias en los desenlaces</b> No favorece Probióticos      Favorece Probióticos	<b>Efecto relativo</b> (IC 95%) N° de participantes y estudios	<b>Certeza de la Evidencia</b> GRADE
<b>Diarrea</b> <ul style="list-style-type: none"> <li><input checked="" type="radio"/> Destino de alto riesgo</li> <li><input type="radio"/> Destino de moderado riesgo</li> <li><input type="radio"/> Destino de bajo riesgo</li> </ul>	<div> <div>450</div> <div>por 1000</div> </div> <div> <div>347</div> <div>por 1000</div> </div> <div> <b>Diferencia: 103 personas menos por 1000</b>                      (IC 95%: 180 a 0 menos personas)                 </div>	<p>103 personas menos por 1000</p>	<b>RR 0,77</b> (0,60 a 1,00) Basado en datos de 4025 personas en 12 estudios	<div>⊕ ⊕ ⊕ ⊕</div> <div>Baja</div>

August 2015

GRADE-DECIDE

**Antibiotics for middle ear infection (acute otitis media) in children**

## ▼ Question details

**Participants:** Children with middle ear infection**Interventions:** Antibiotics (+analgesia); Placebo (+analgesia)► **Source :** Two reviews: a systematic review and a Cochrane review

Outcomes	Plain language statements	Absolute Effect		Relative effect (95% CI) N° of participants & studies	Certainty of the evidence GRADE
With Placebo	With Antibiotics				
<b>Pain or fever after 3 to 7 days</b> ⓘ <input checked="" type="radio"/> ≥ 2 years old, 1-sided infection <input type="radio"/> < 2 years old, 2-sided infection	<i>After 3 to 7 days antibiotics probably slightly reduce the number of children who have pain or fever compared to no antibiotic treatment</i>	26 per 100	24 per 100	<b>RR 0.92</b> (0.85 to 1.01) Based on data from 1643 children in 6 studies	⊕⊕⊕⊕ Moderate ⓘ
<b>Diarrhoea, vomiting, or rash</b> ⓘ	<i>Antibiotics increase the number of children who have diarrhoea, vomiting, or rash compared to no antibiotic treatment</i>	20 per 100	27 per 100	<b>RR 1.38</b> (1.19 to 1.59) Based on data from 2107 children in 8 studies	⊕⊕⊕⊕ High
► <b>Possible hearing problems after 3 months</b> ⓘ Follow-up: Tympanometry at 3 months					

This range is called 95% confidence interval

**WITH Placebo:** 26 out of 100 children would still have pain or fever after 3 to 7 days



**WITH Antibiotics:** 24 out of 100 children would still have pain or fever after 3 to 7 days