

El CEMIX como escenario para la investigación Condición física y Salud

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Universidad de Granada

&

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FACULTAD DE CIENCIAS DEL DEPORTE

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martes 12/03/2013

Curso de Introducción al Marketing Deportivo

Se presenta el Curso de Introducción al Marketing Deportivo que se celebrará del 18 al 21 de Marzo en la Aula Magna de la Facultad de Ciencias Económicas y Empresariales en horario de...

[LEER +](#)

lunes 11/03/2013

Cristobal Sánchez, profesor de la Facultad de Ciencias del Deporte de Granada, nombrado Director Técnico de la Real Federación Española de Ciclismo

La Junta Directiva de la RFEC ha nombrado, en la reunión celebrada el 8 de marzo...

[LEER +](#)

jueves 07/03/2013

Beca de Intercambio de estudiantes de la Facultad de Ciencias del Deporte y Facultad Ciencias de la Salud. Curso 2013/2014. Programa basado en el Proyecto del Programa EU-US Atlantis

Beca de Intercambio de estudiantes de la

CALENDARIO DE EXÁMENES
2012/2013



PETICIÓN DE MATERIAL E
INSTALACIONES



HORARIOS DEL CURSO
2012-2013



PLATAFORMA DE EMPLEO
Facultad del Deporte
Granada



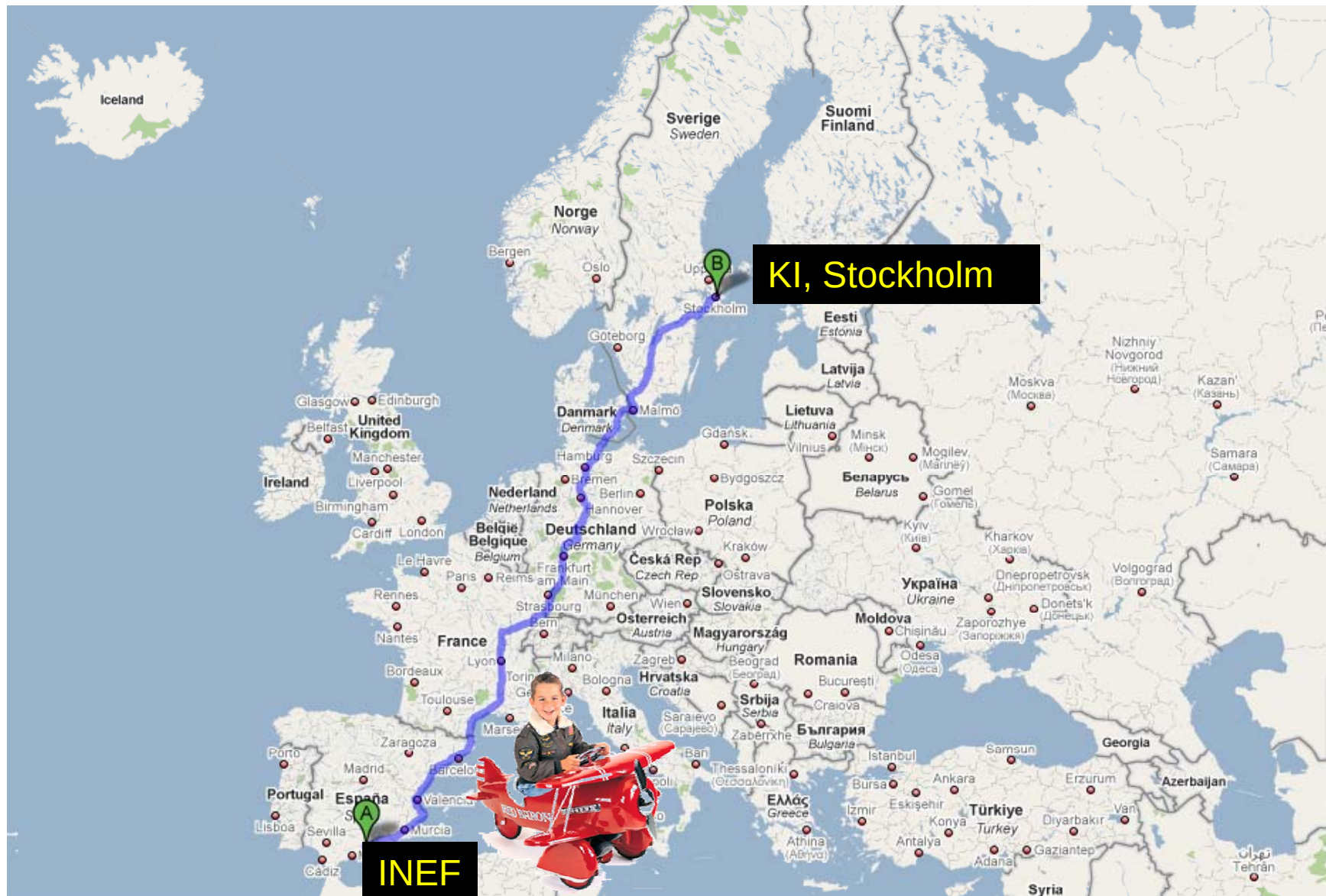
ATILA
Aplicación para Solicitud
Medios a Laboratorios



CALENDARIO DE APERTURA
Y CIERRE REGISTRO











Time for Science !

Esquema de la presentación

- 1) Condición física y concretamente fuerza muscular como predictor de mortalidad
- 2) Posibilidades de investigación futura

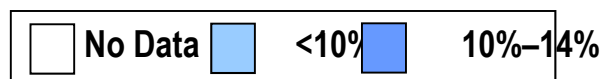
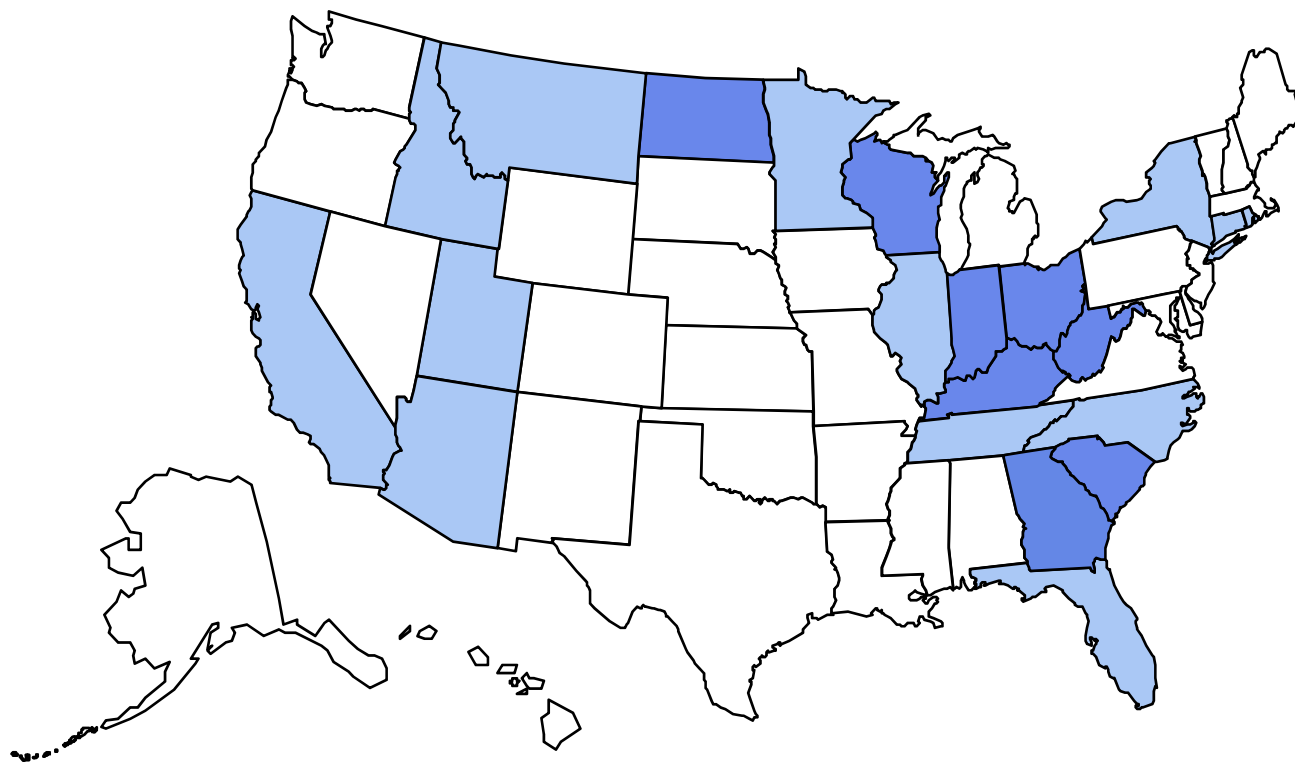
Obesidad



Obesity Trends* Among U.S. Adults

BRFSS, 1985

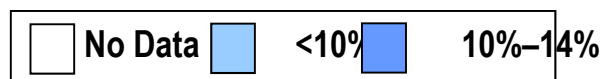
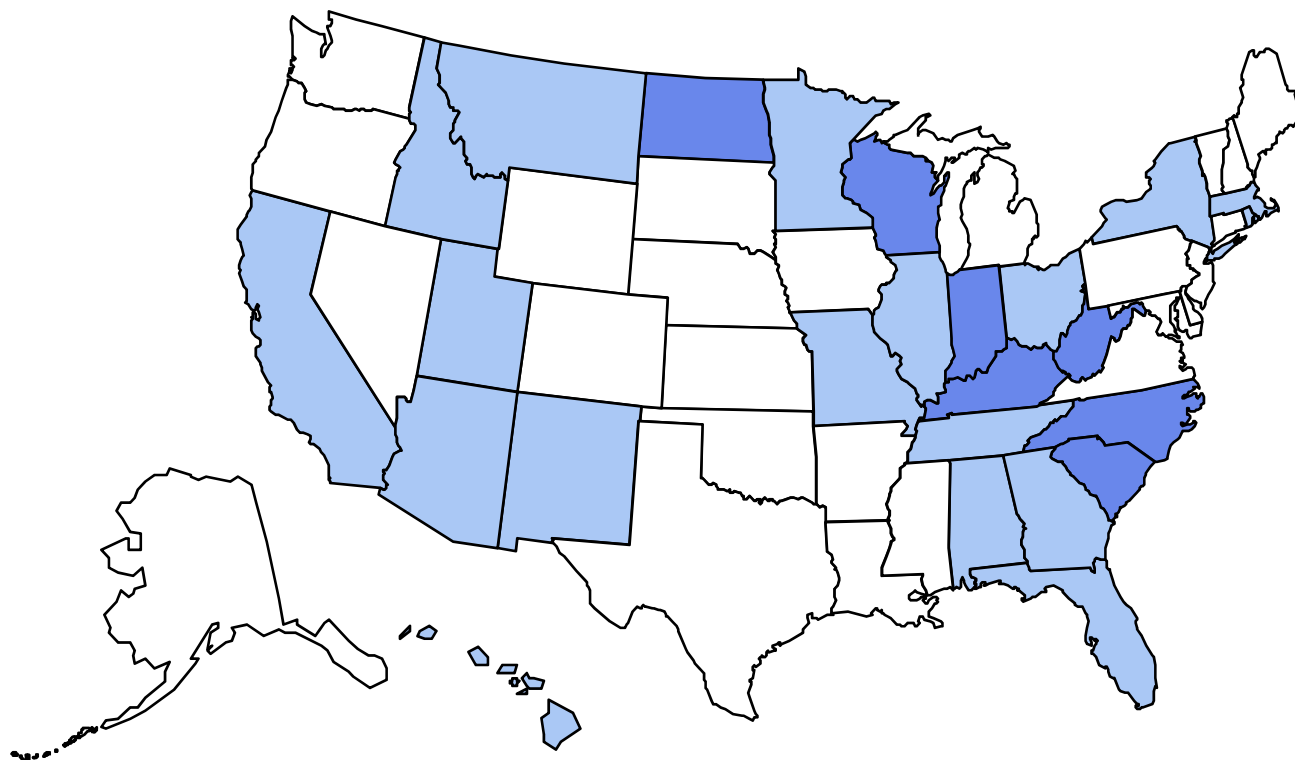
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1986

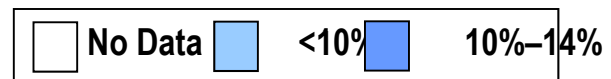
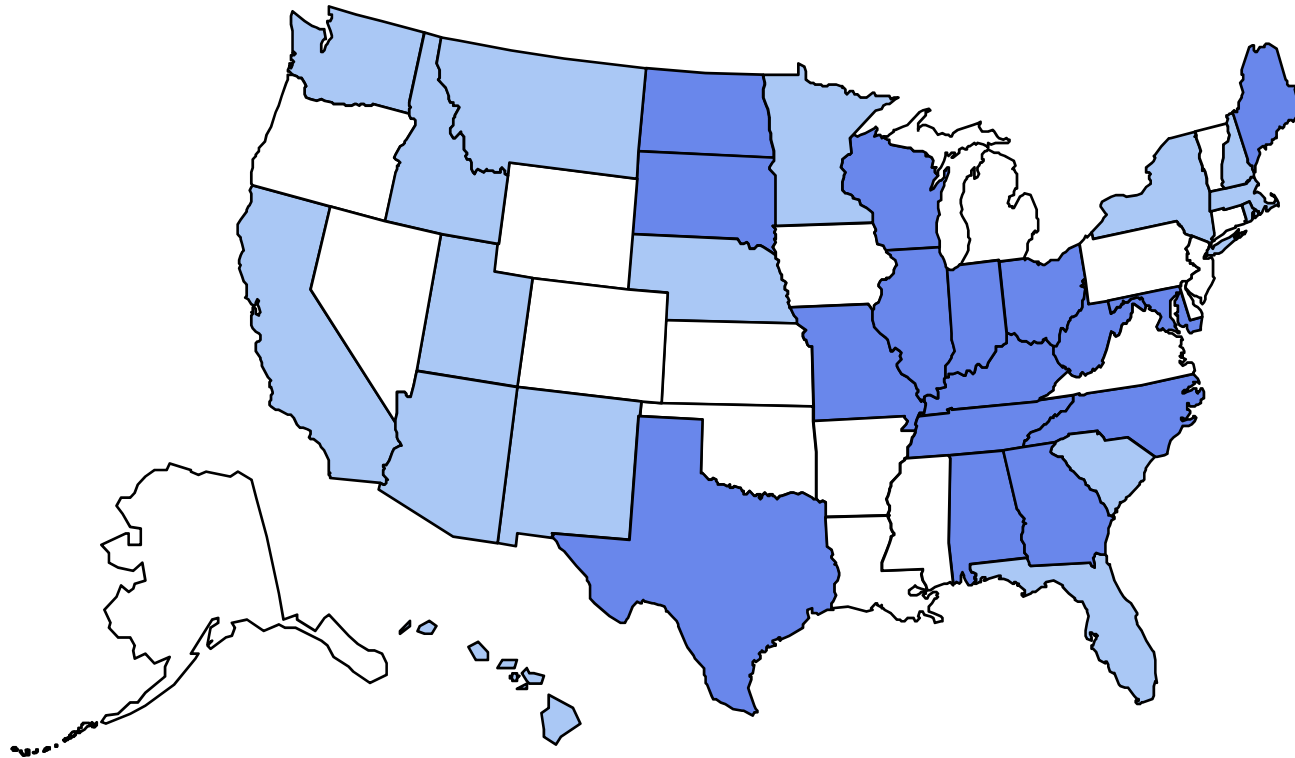
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1987

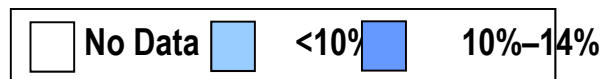
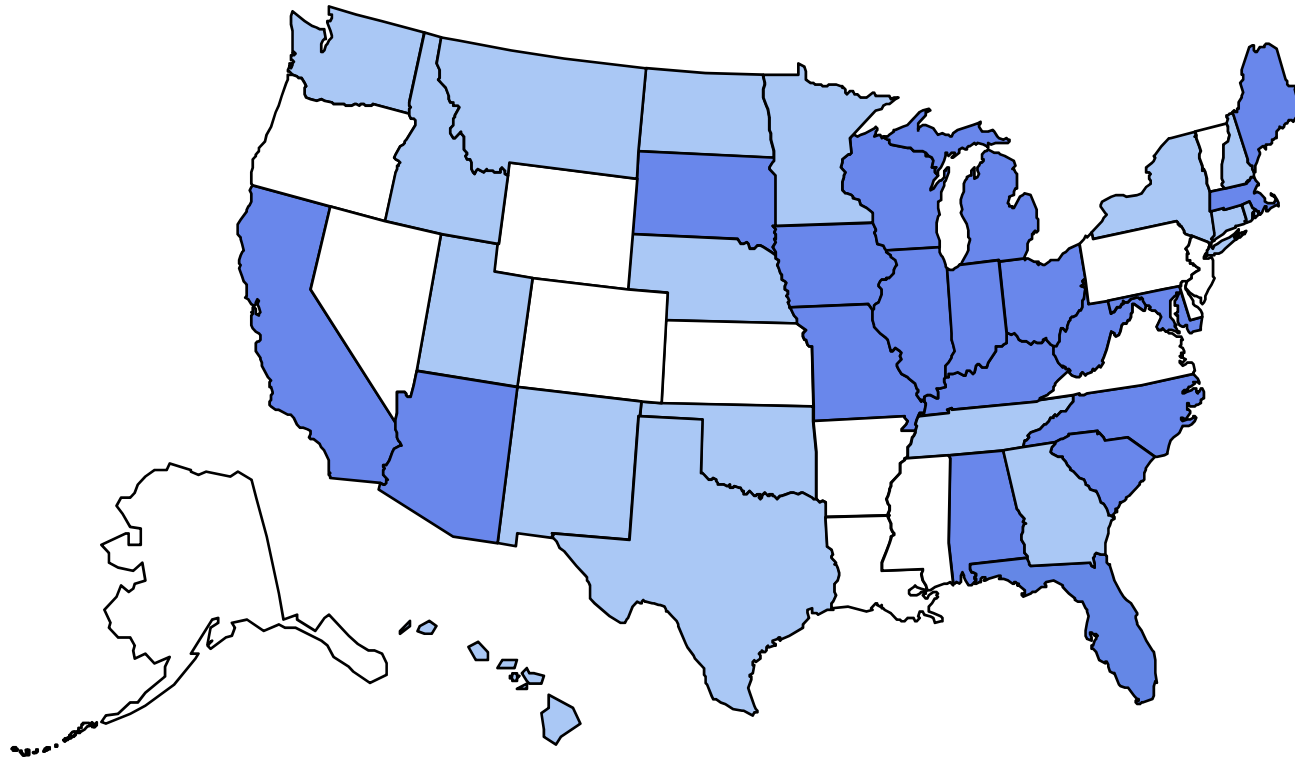
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1988

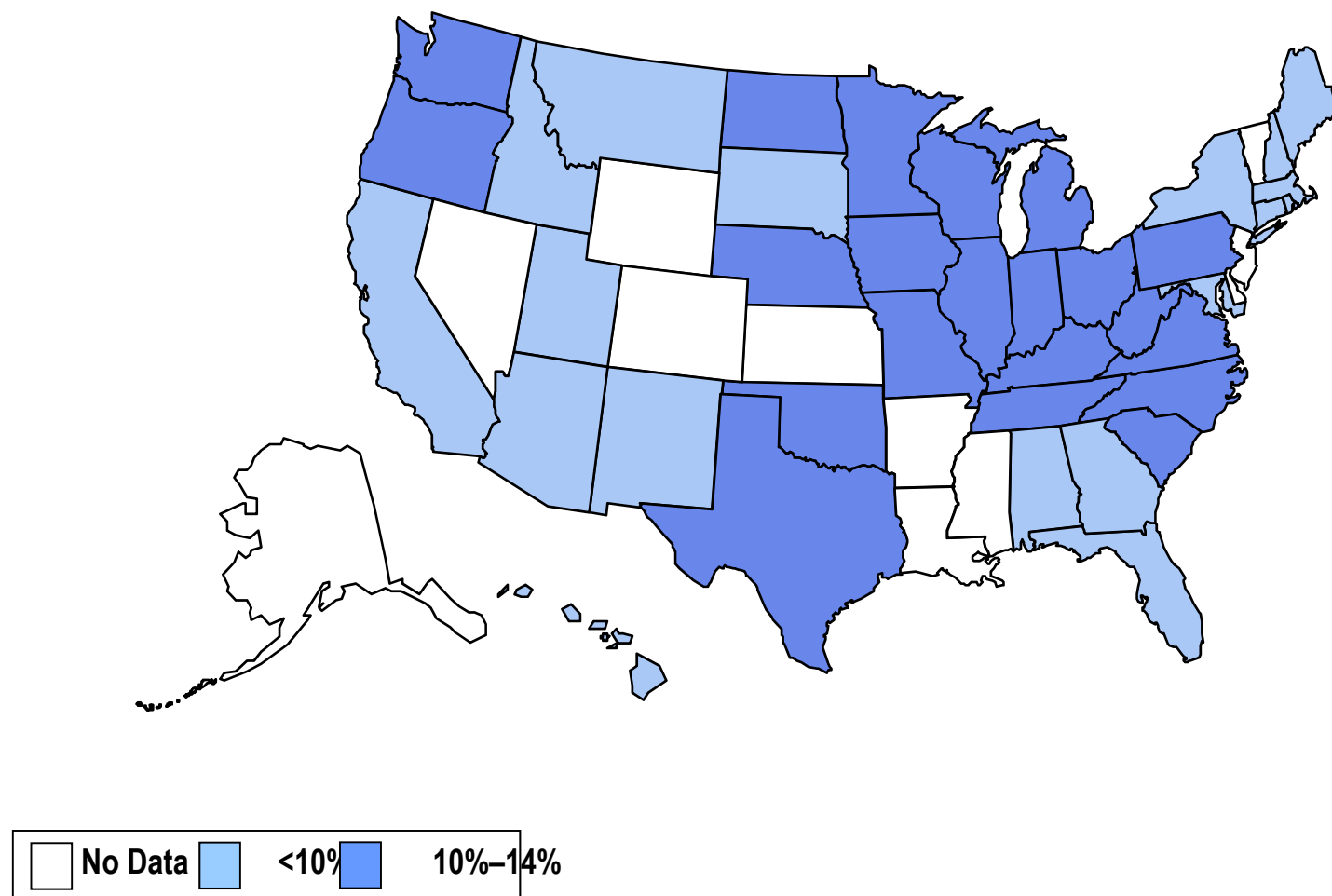
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1989

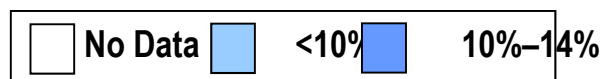
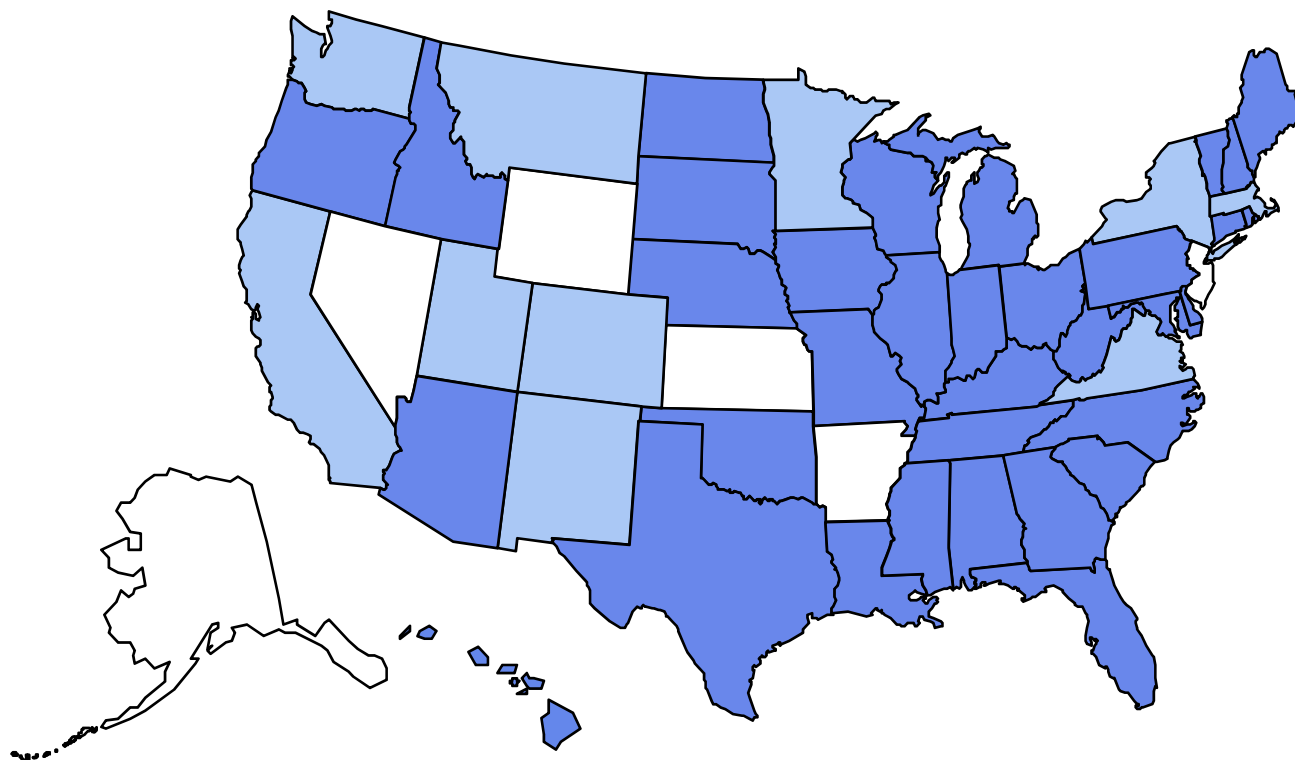
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1990

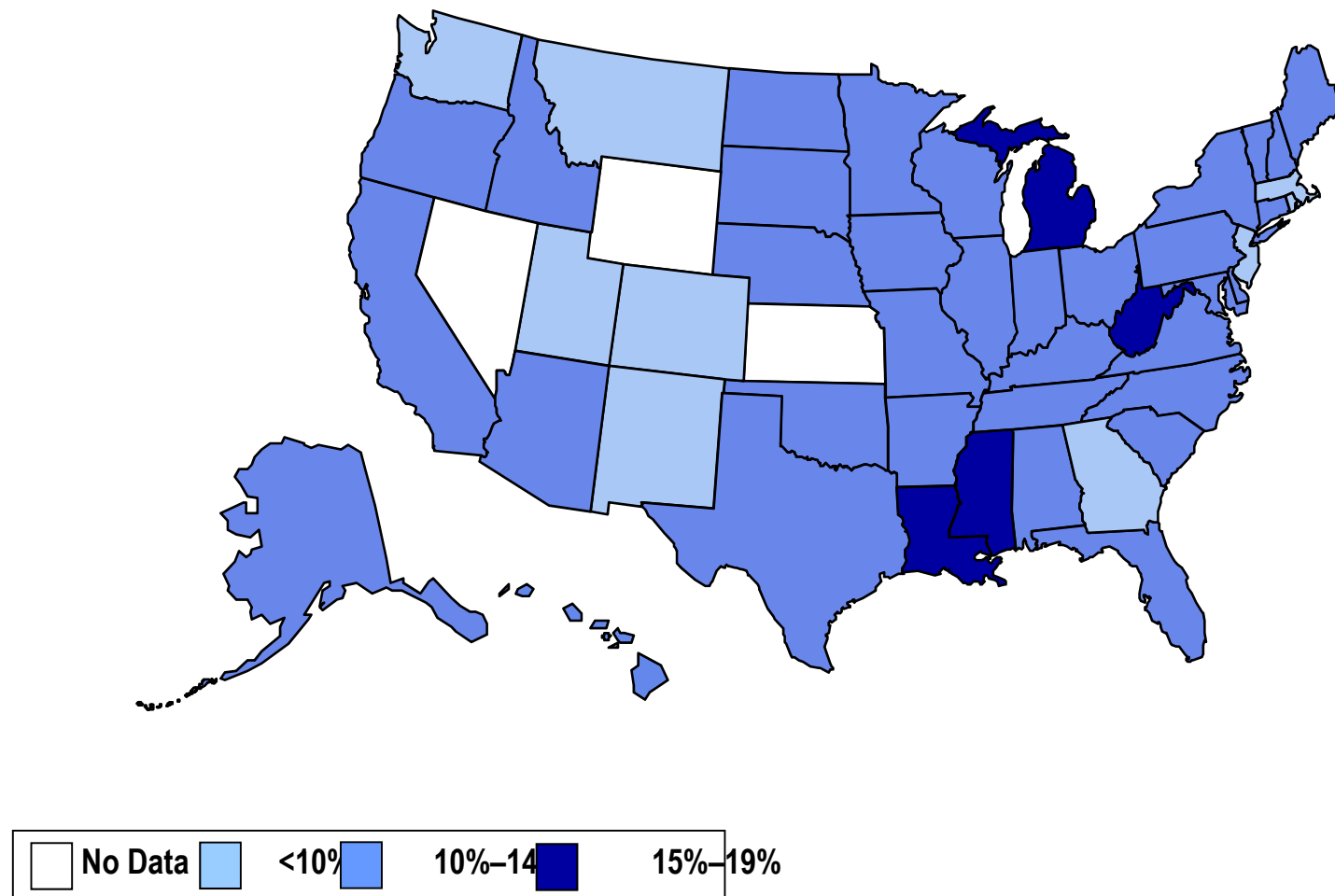
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1991

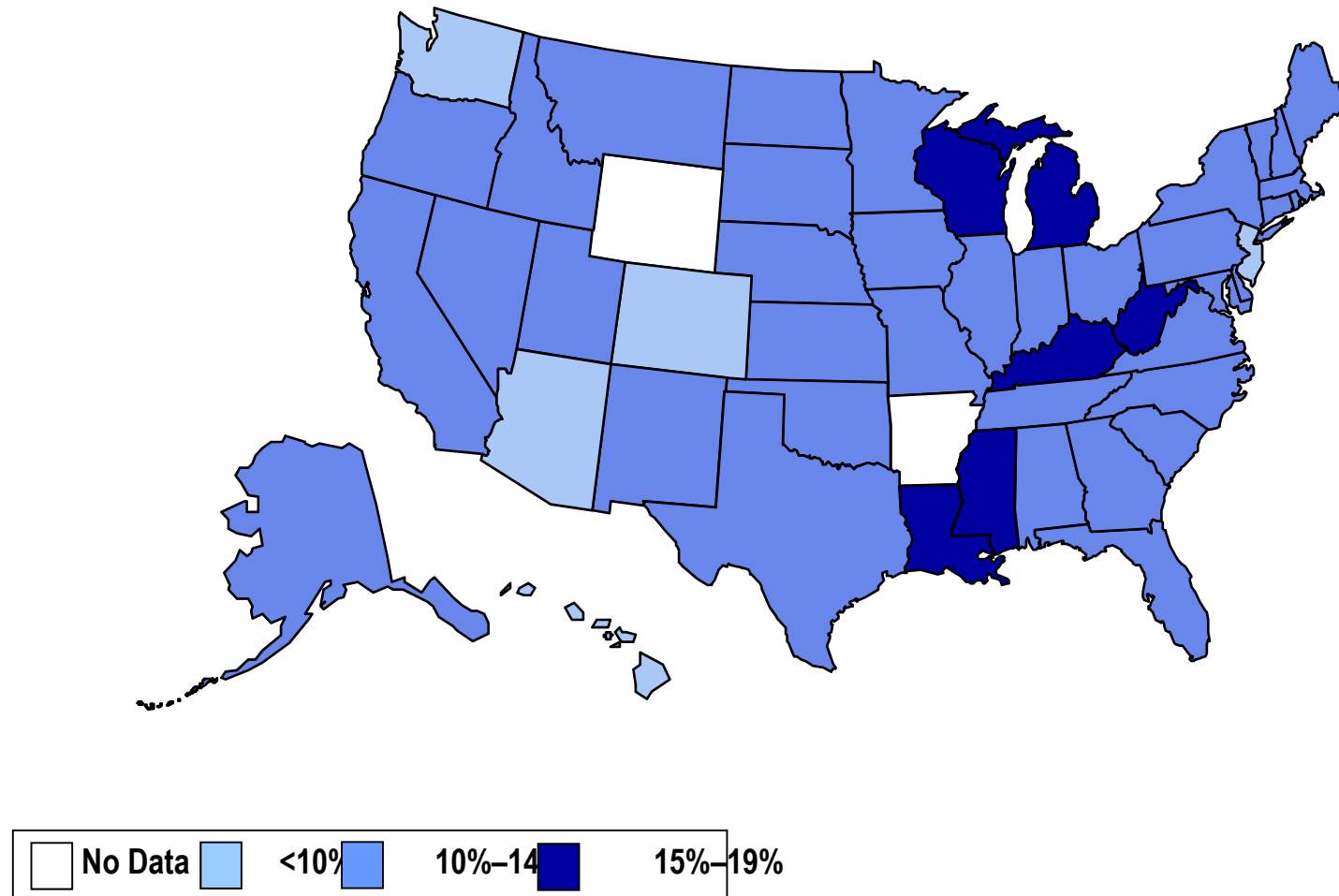
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1992

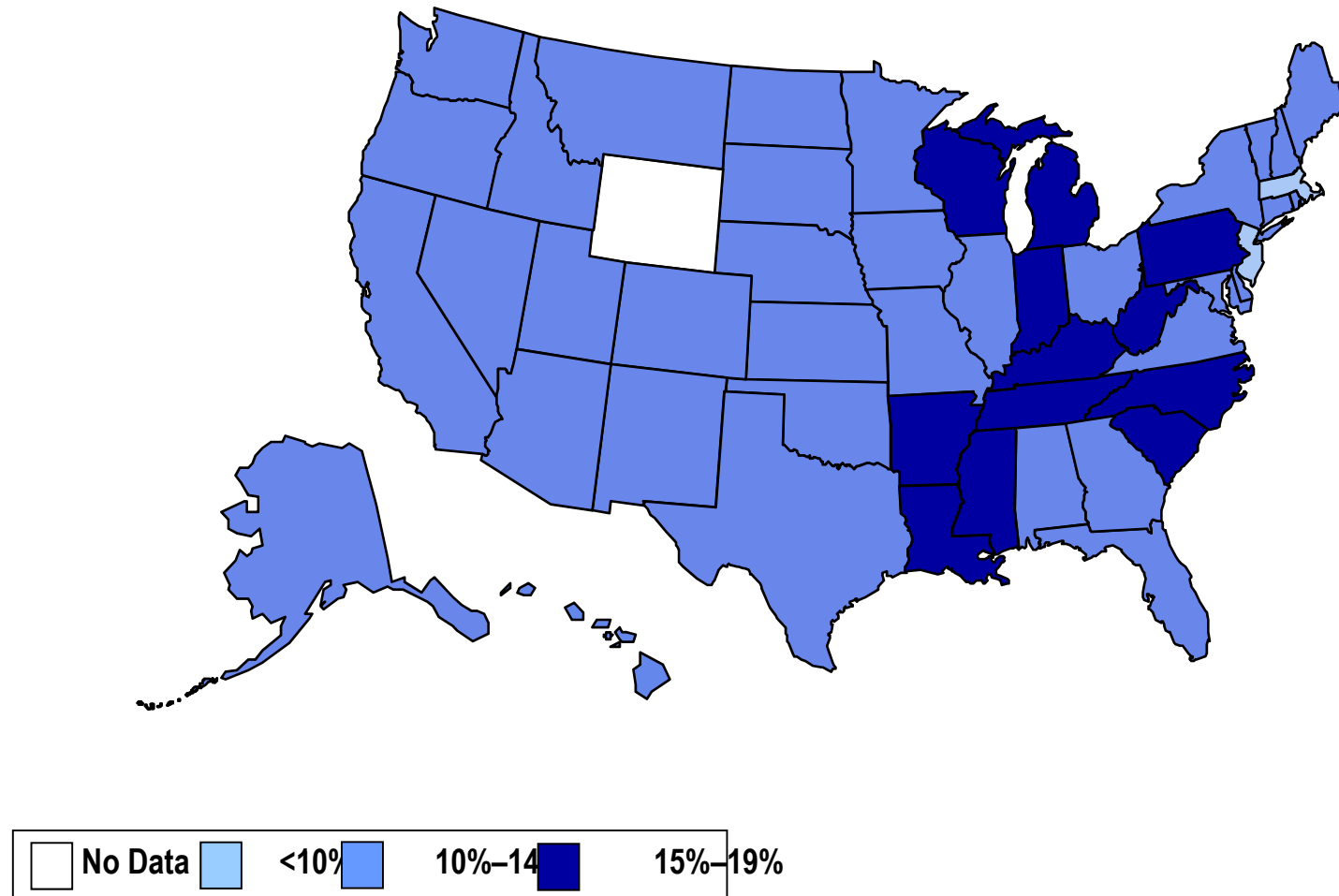
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1993

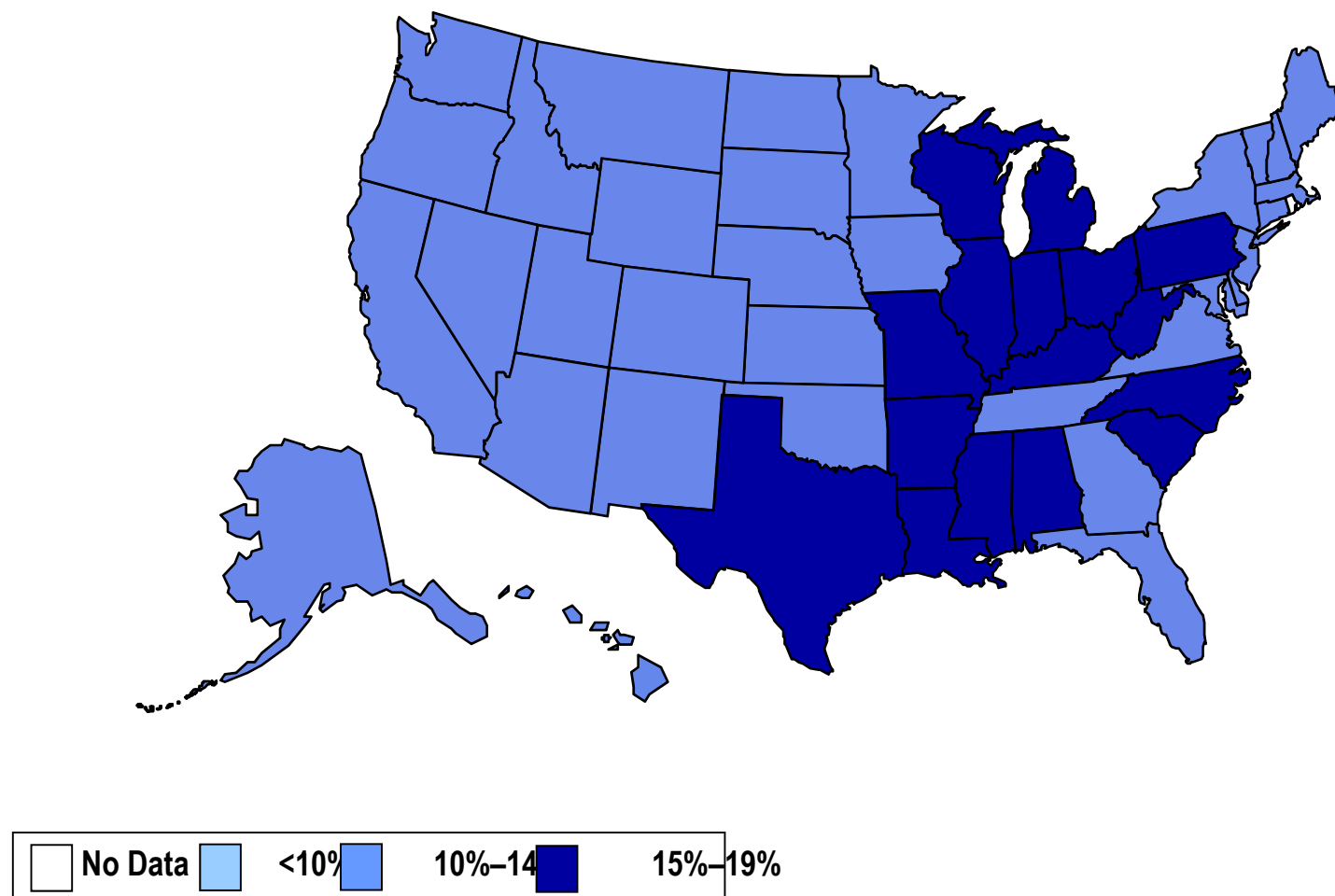
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1994

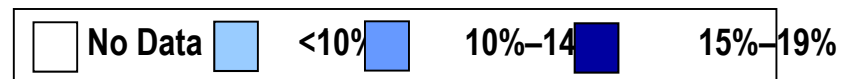
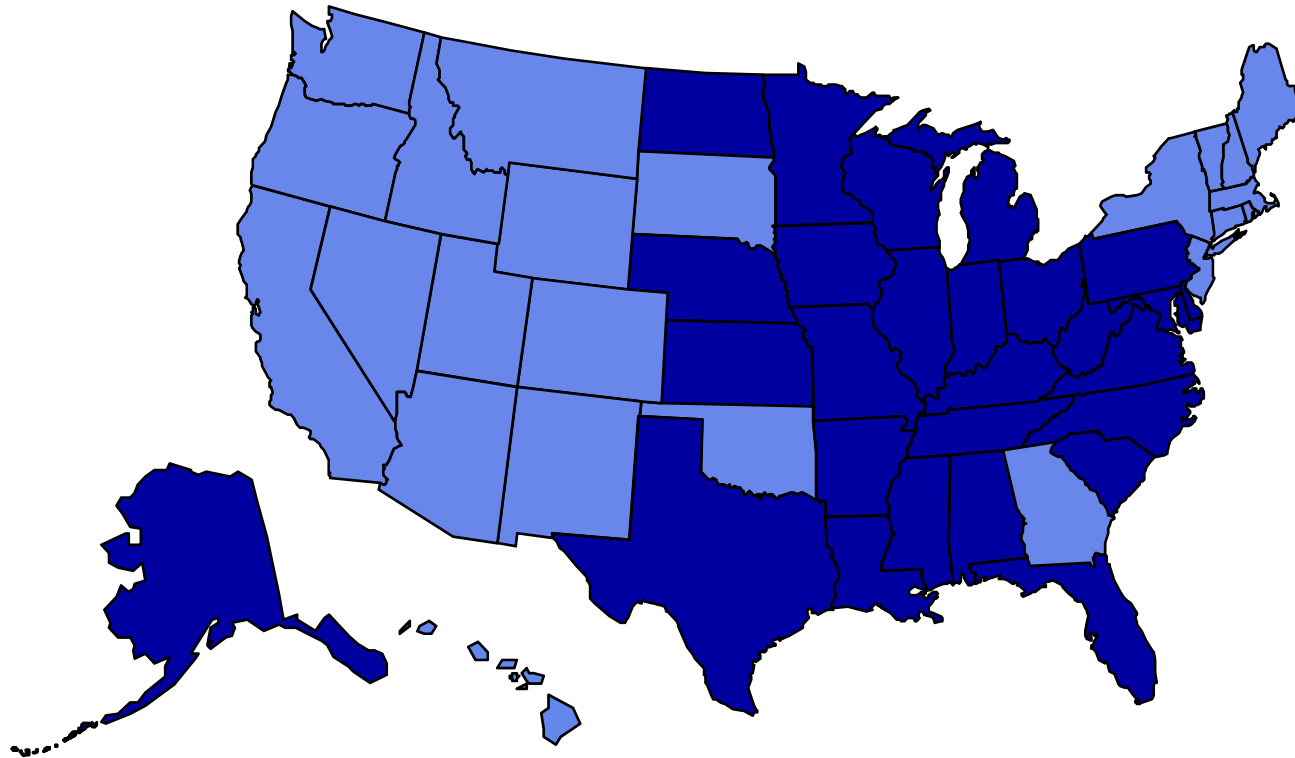
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1995

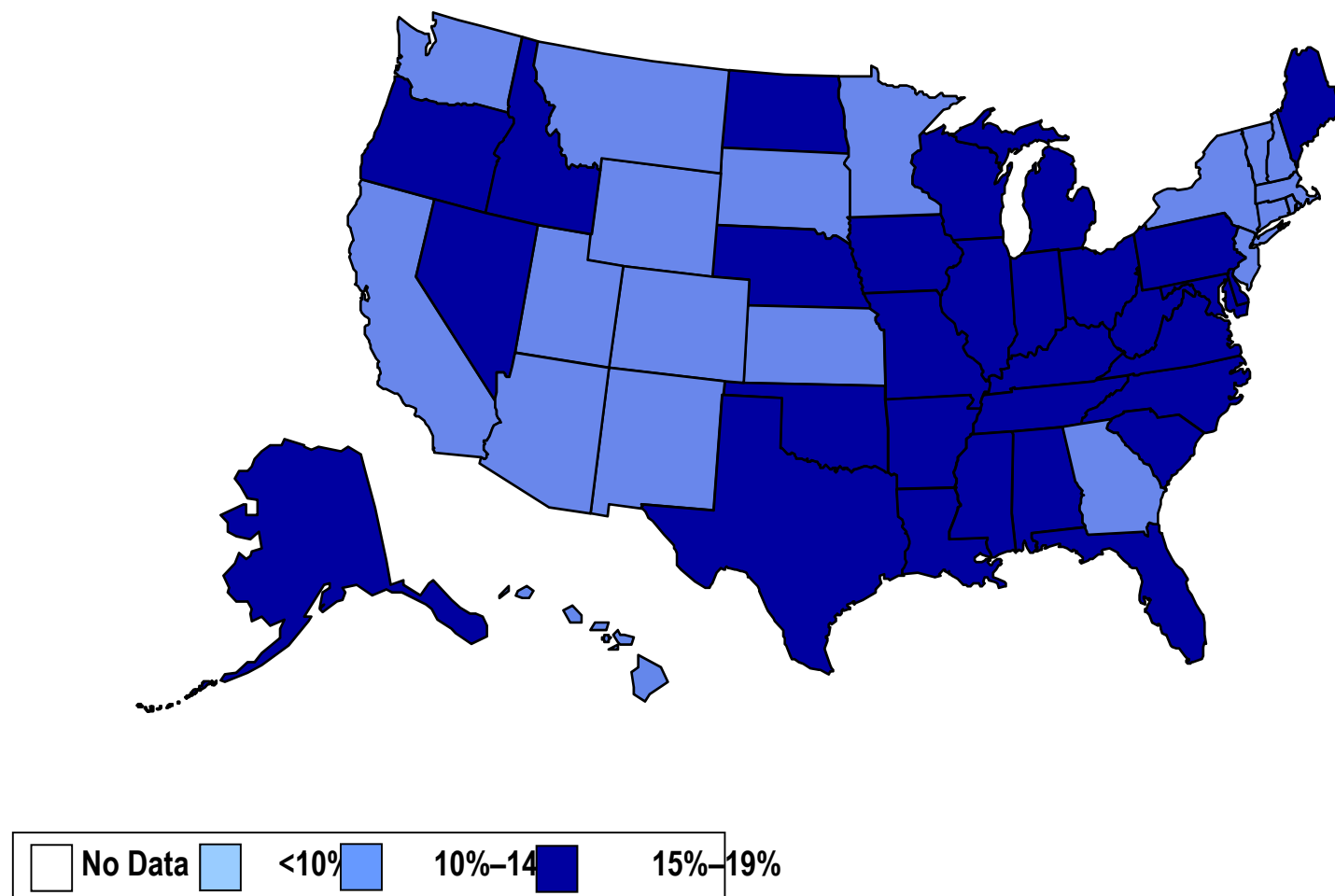
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1996

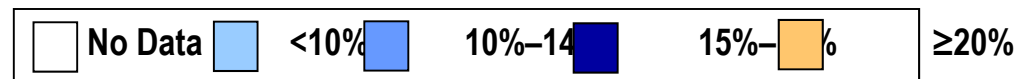
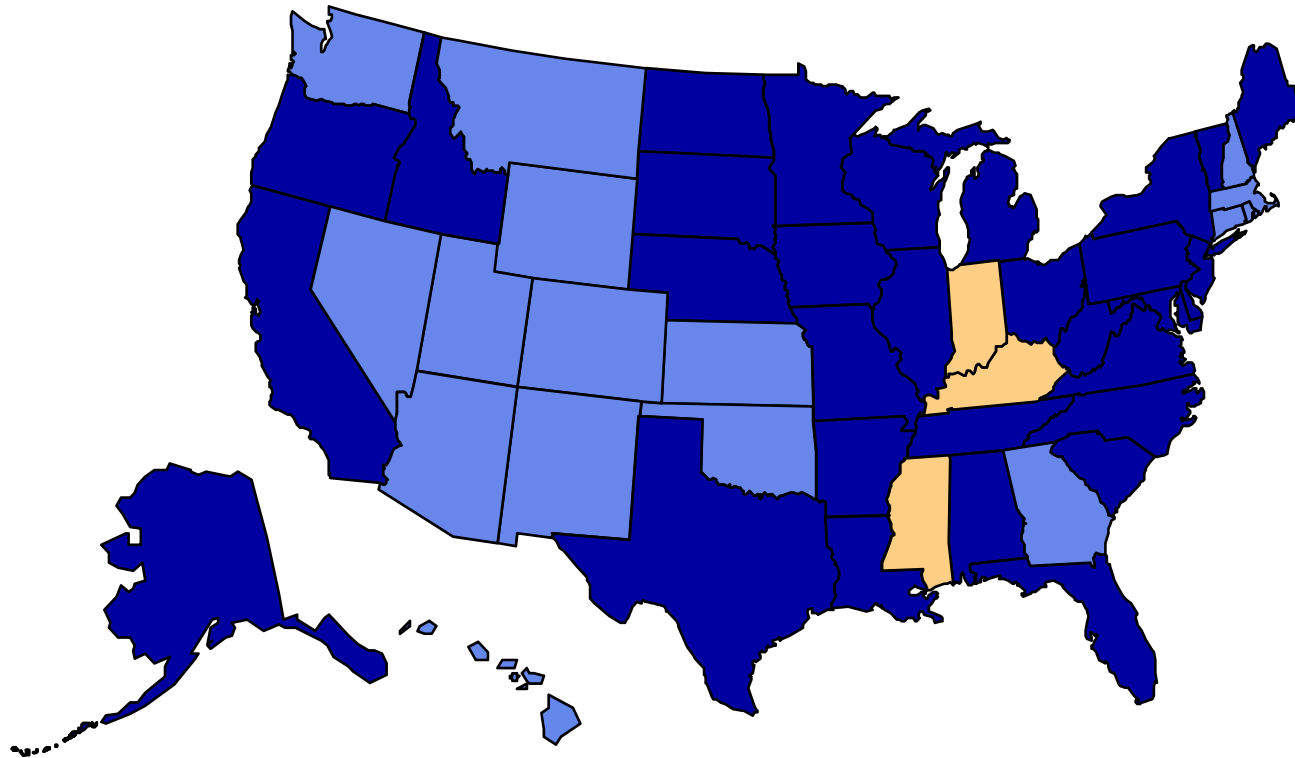
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1997

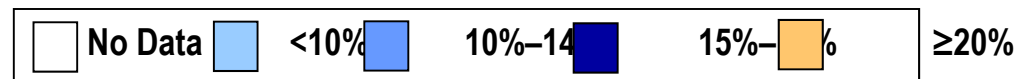
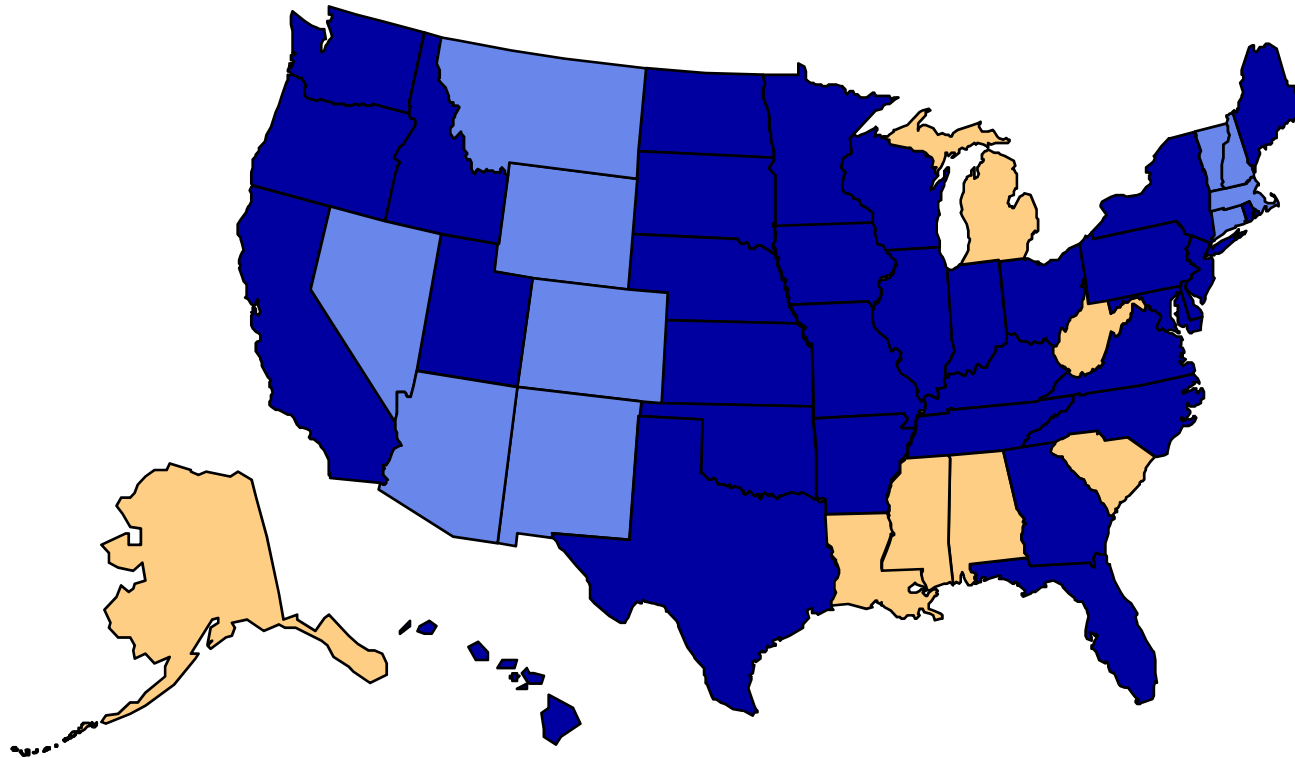
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1998

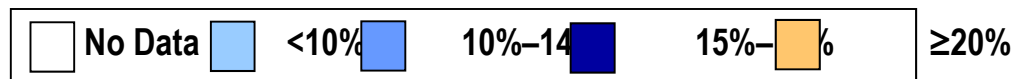
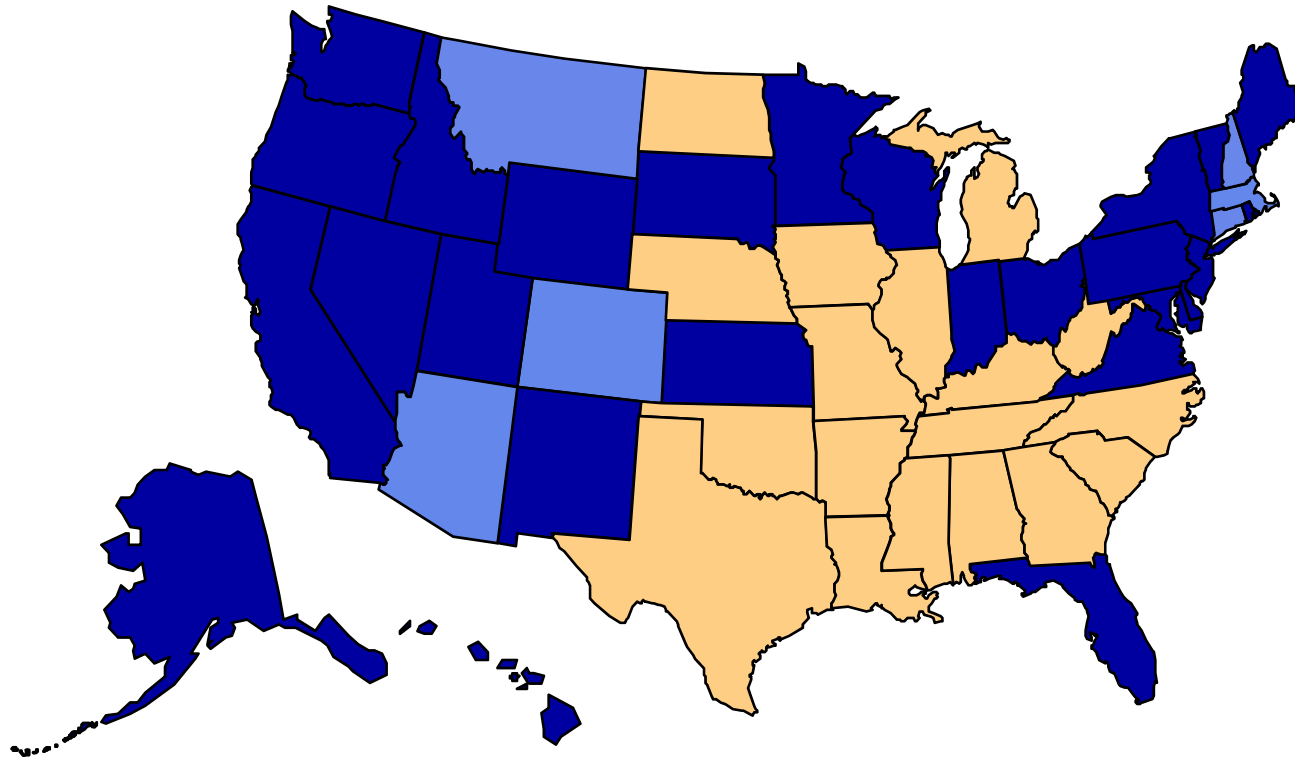
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1999

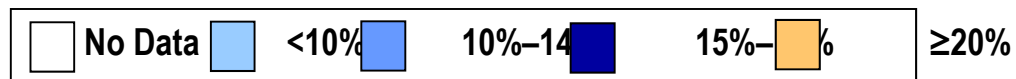
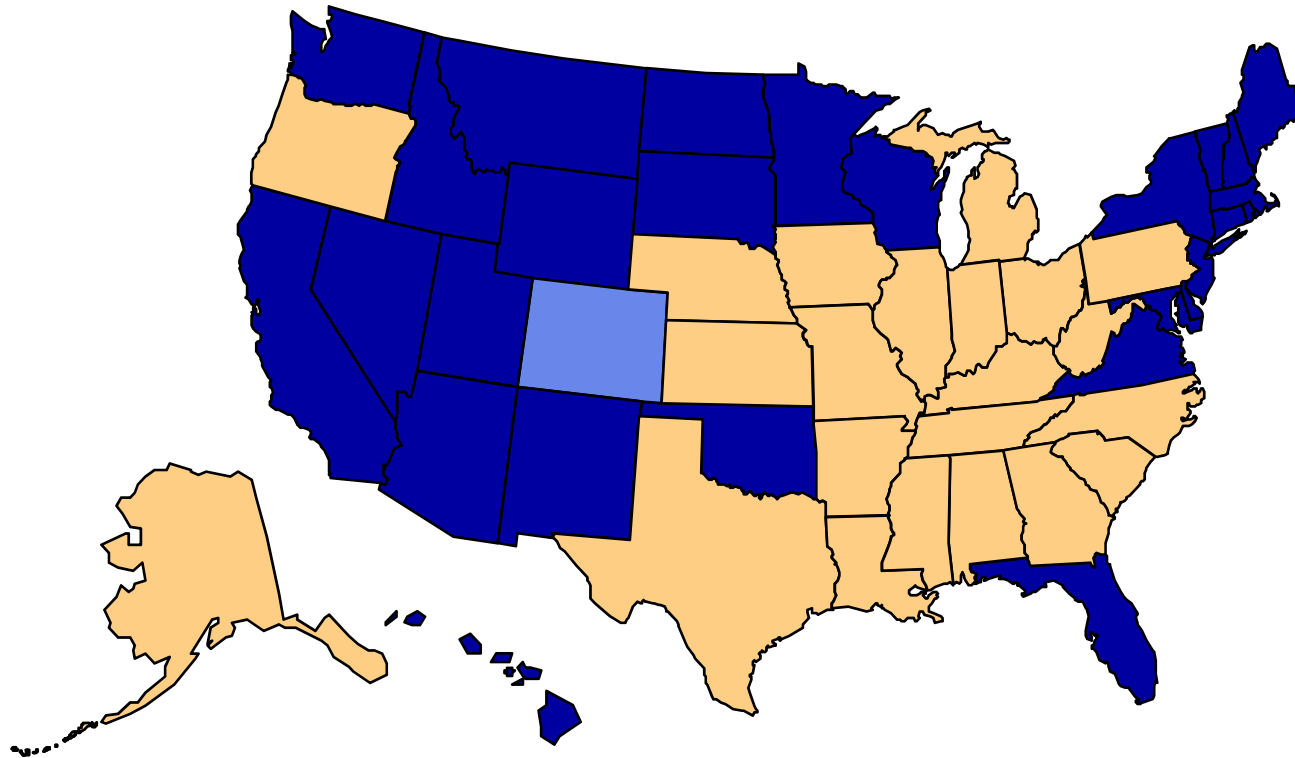
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2000

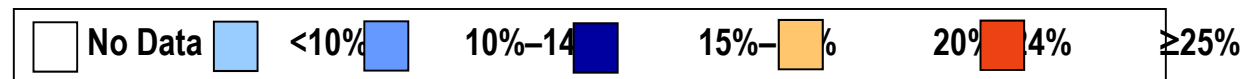
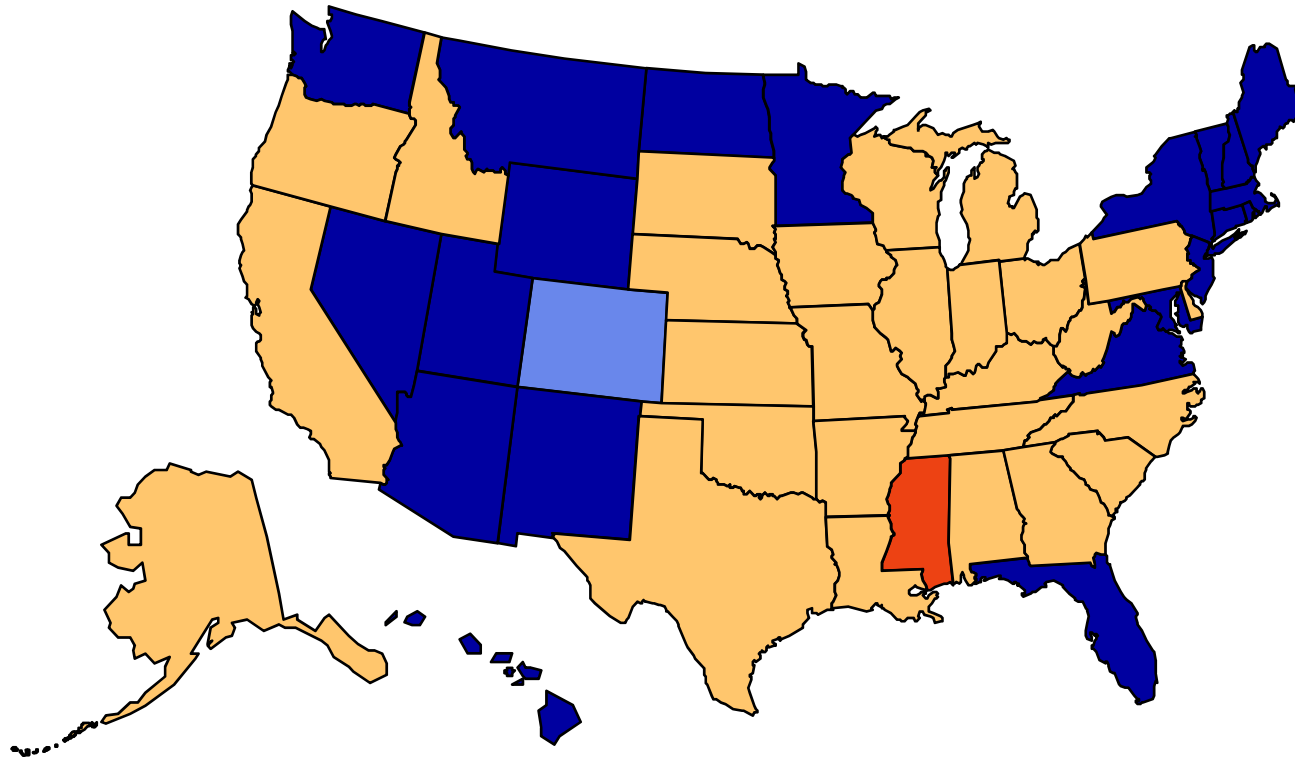
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2001

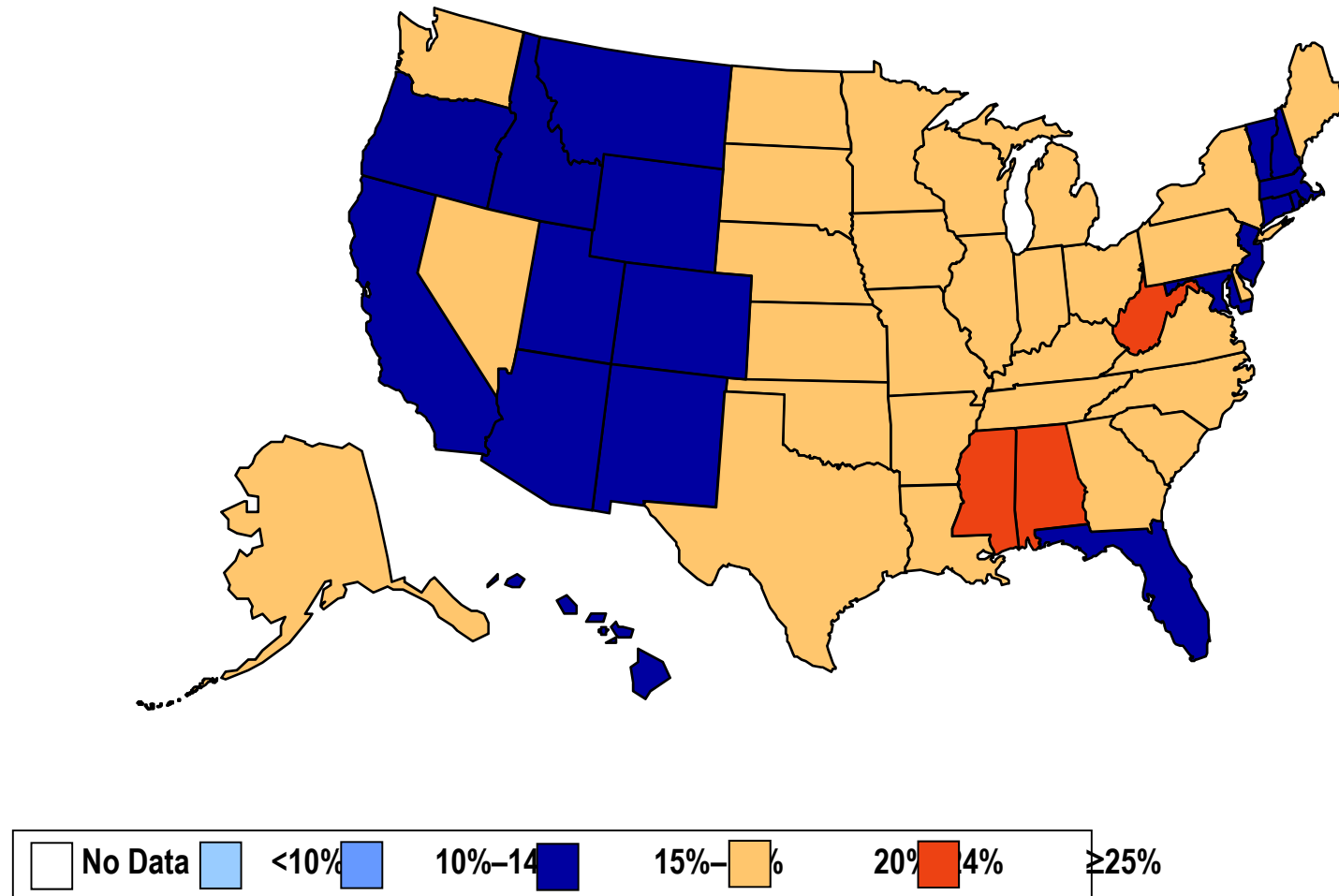
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2002

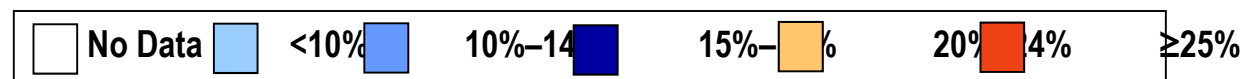
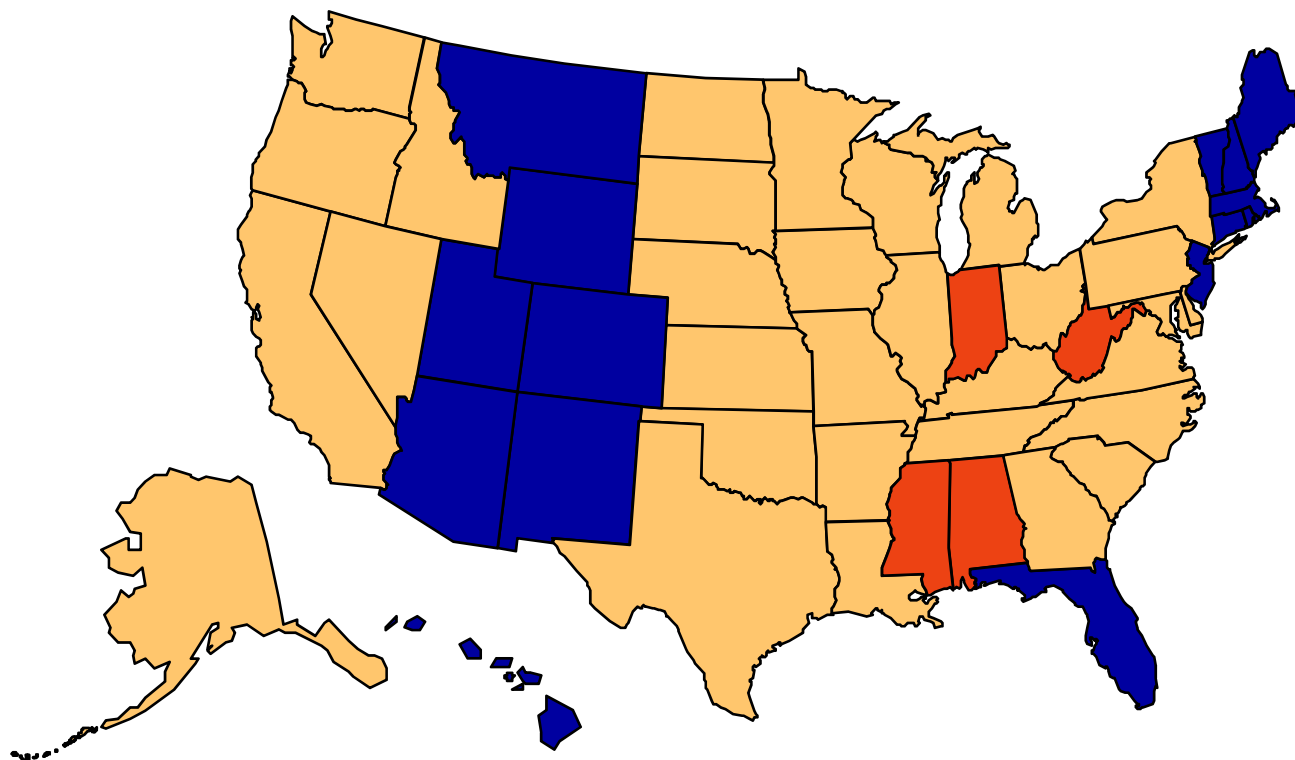
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2003

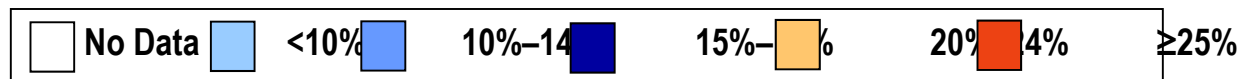
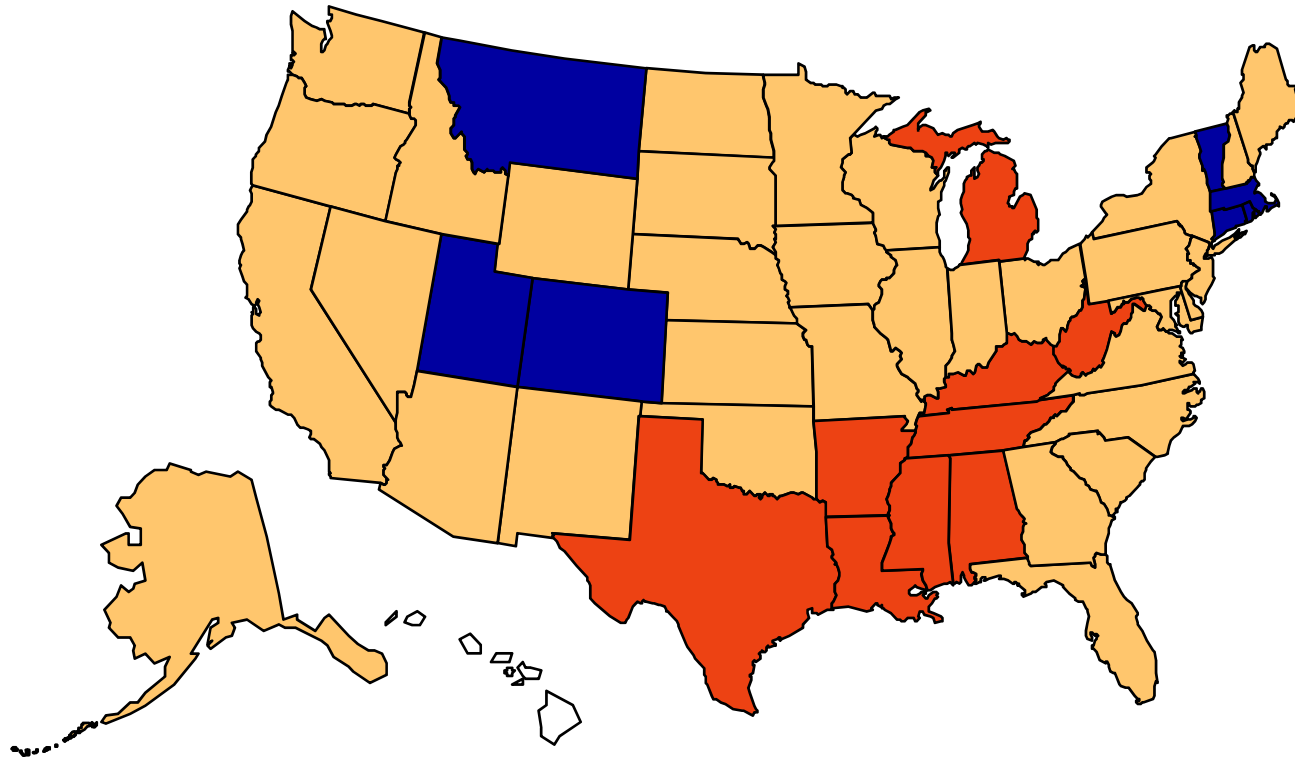
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2004

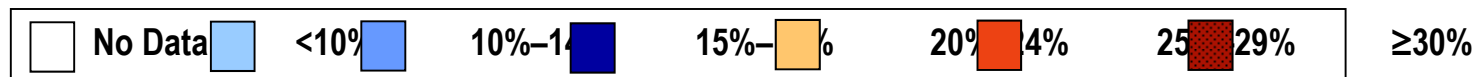
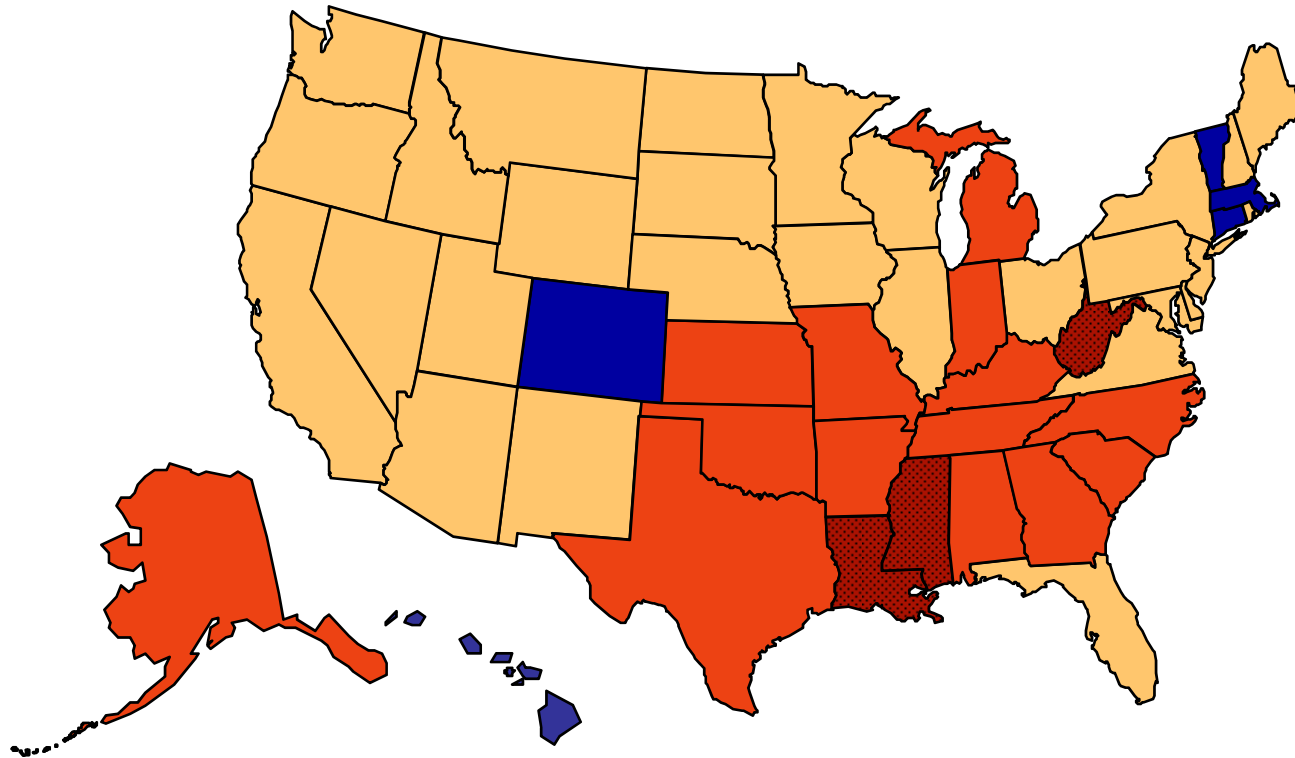
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2005

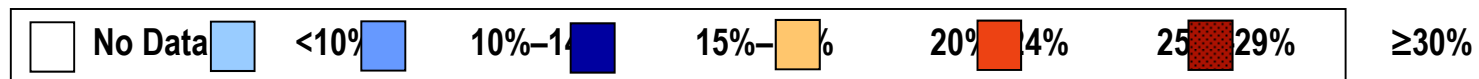
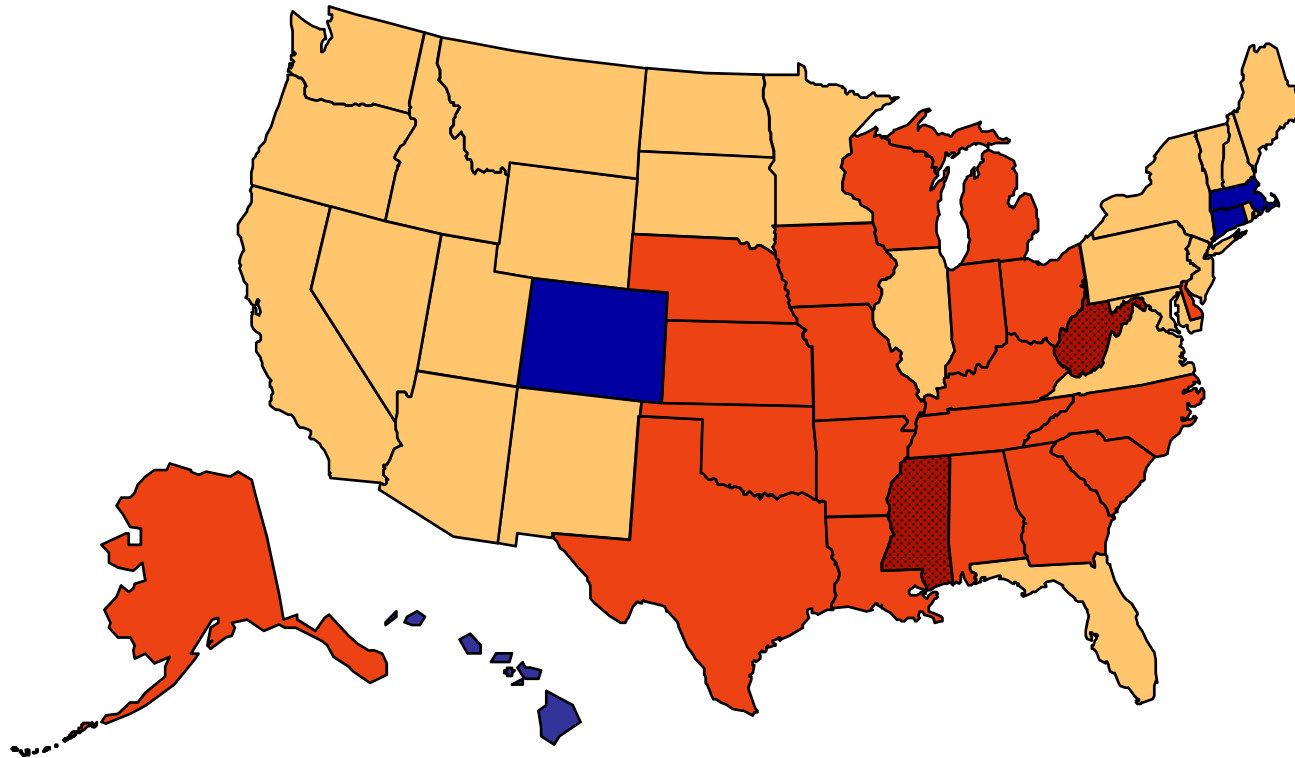
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2006

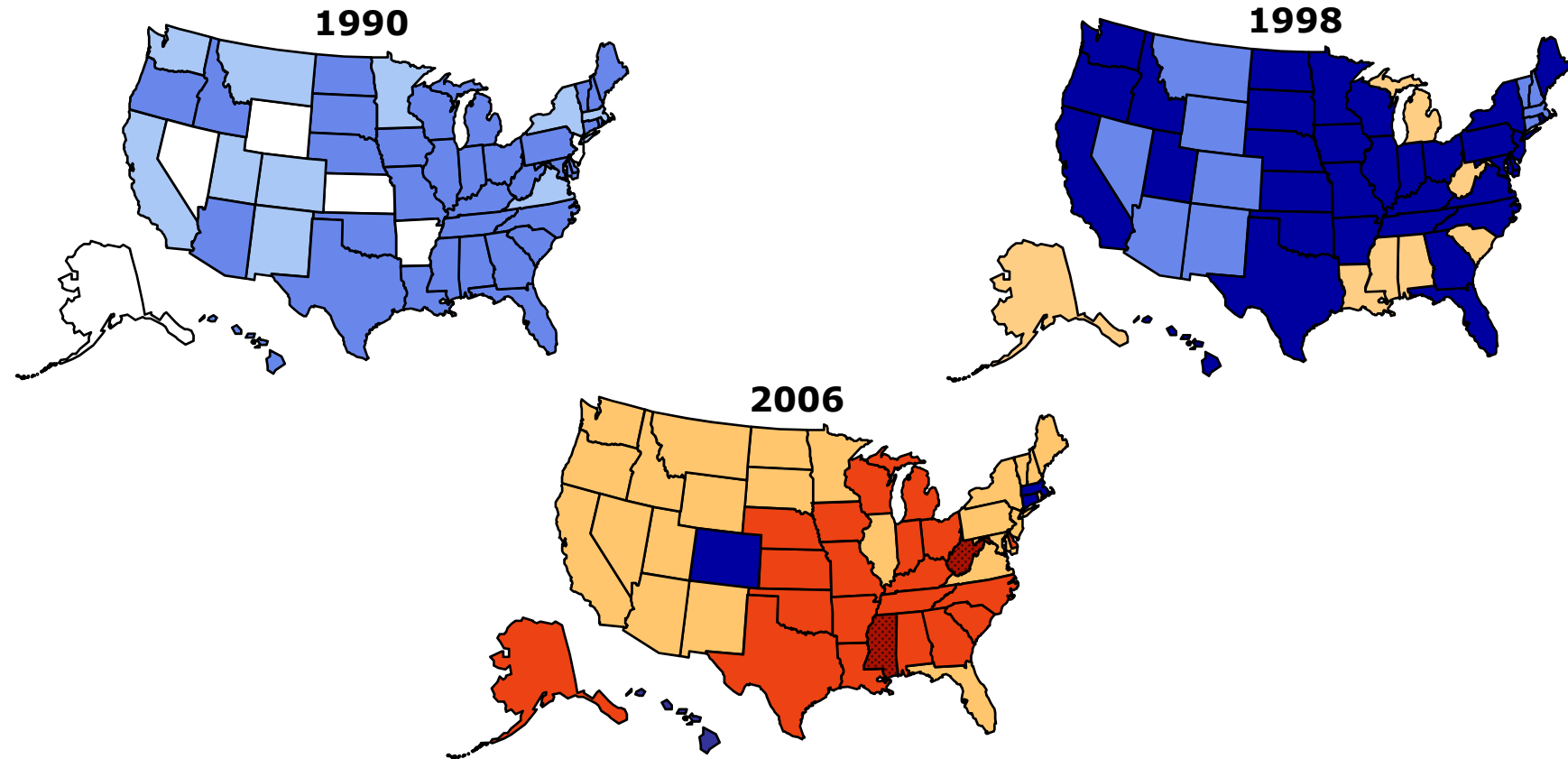
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1990, 1998, 2006

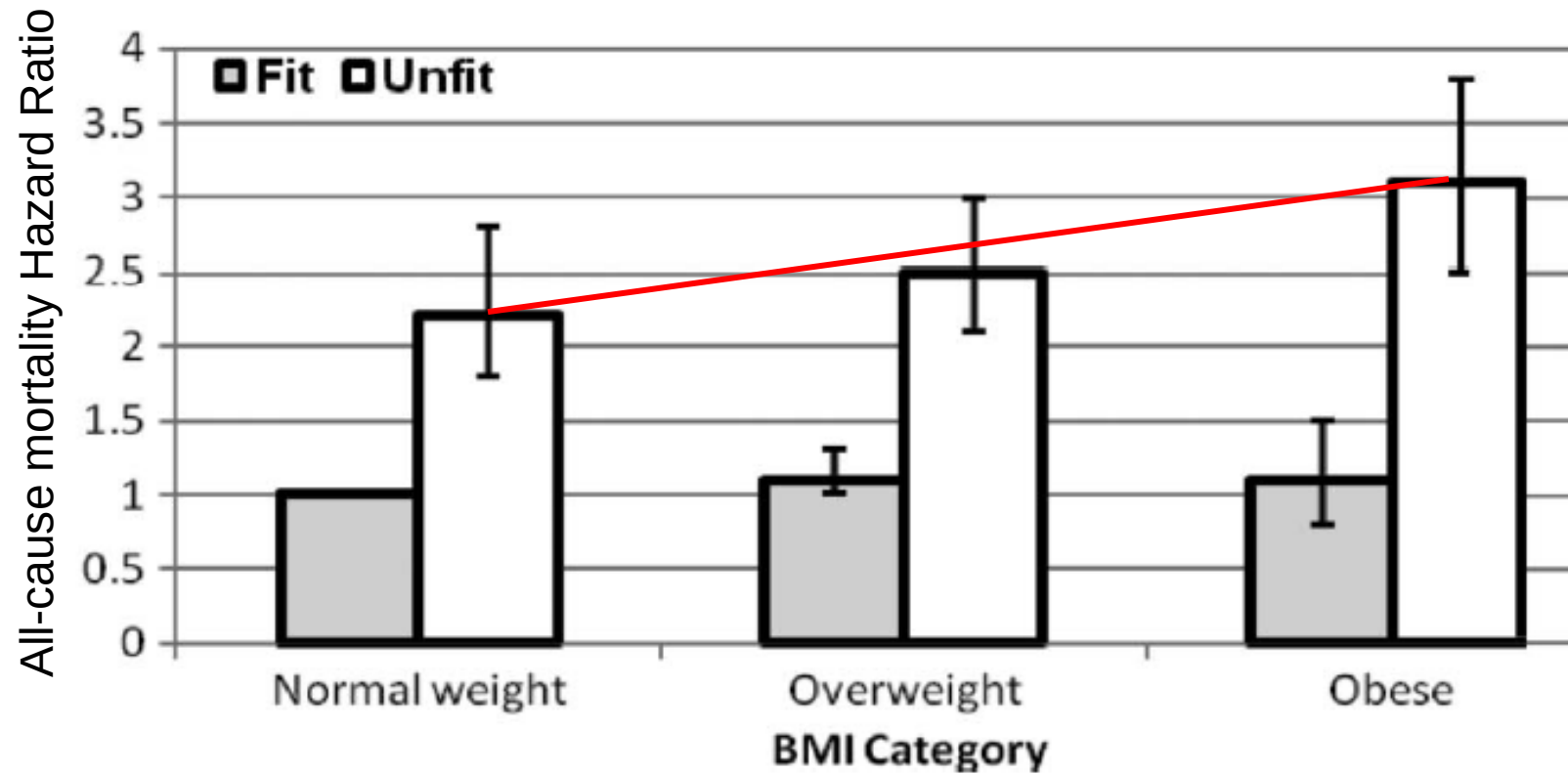
(*BMI ≥ 30 , or about 30 lbs. overweight for 5'4" person)



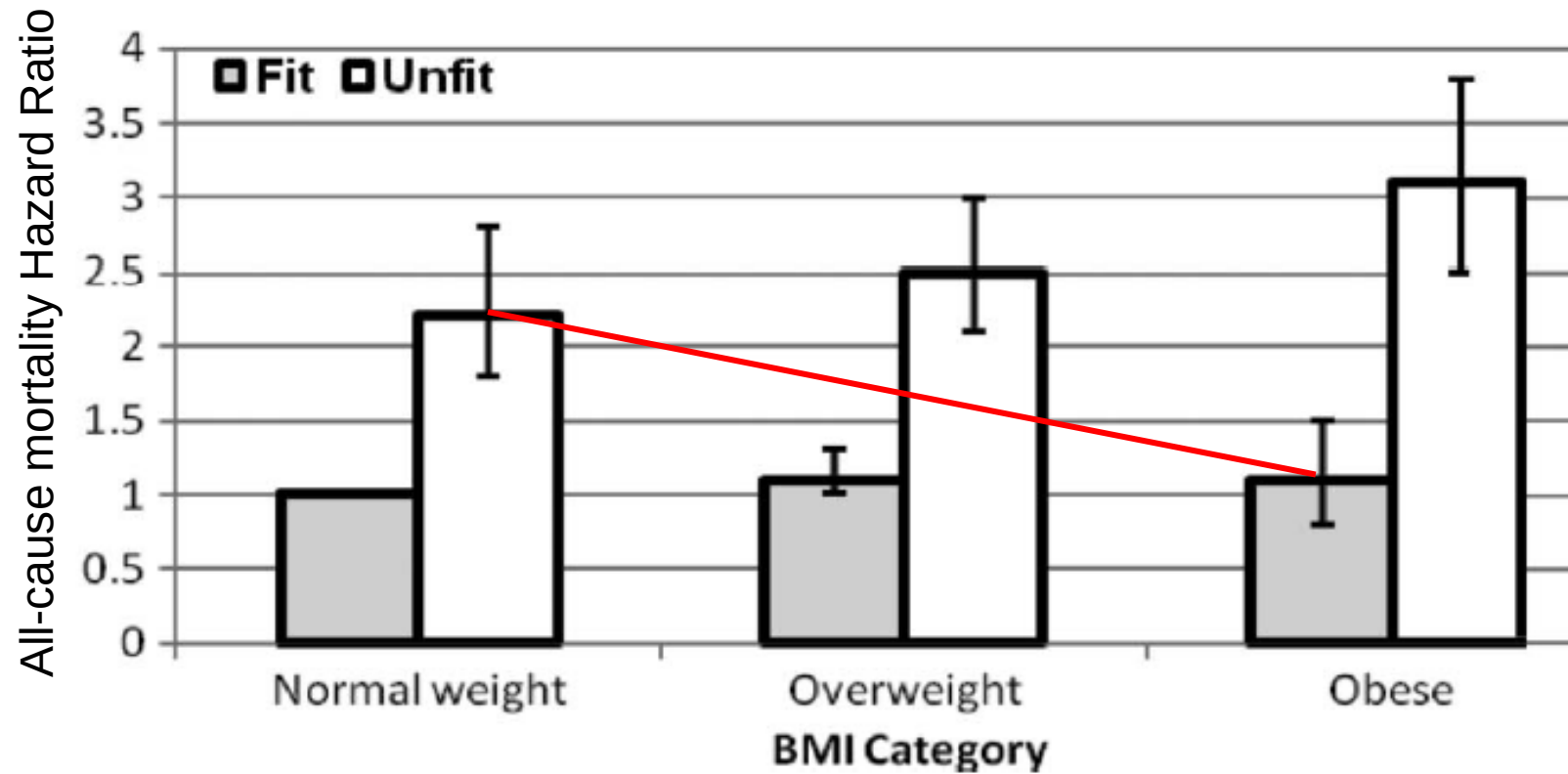
Qué pintamos nosotros
en esta historia ???

FAT BUT FIT





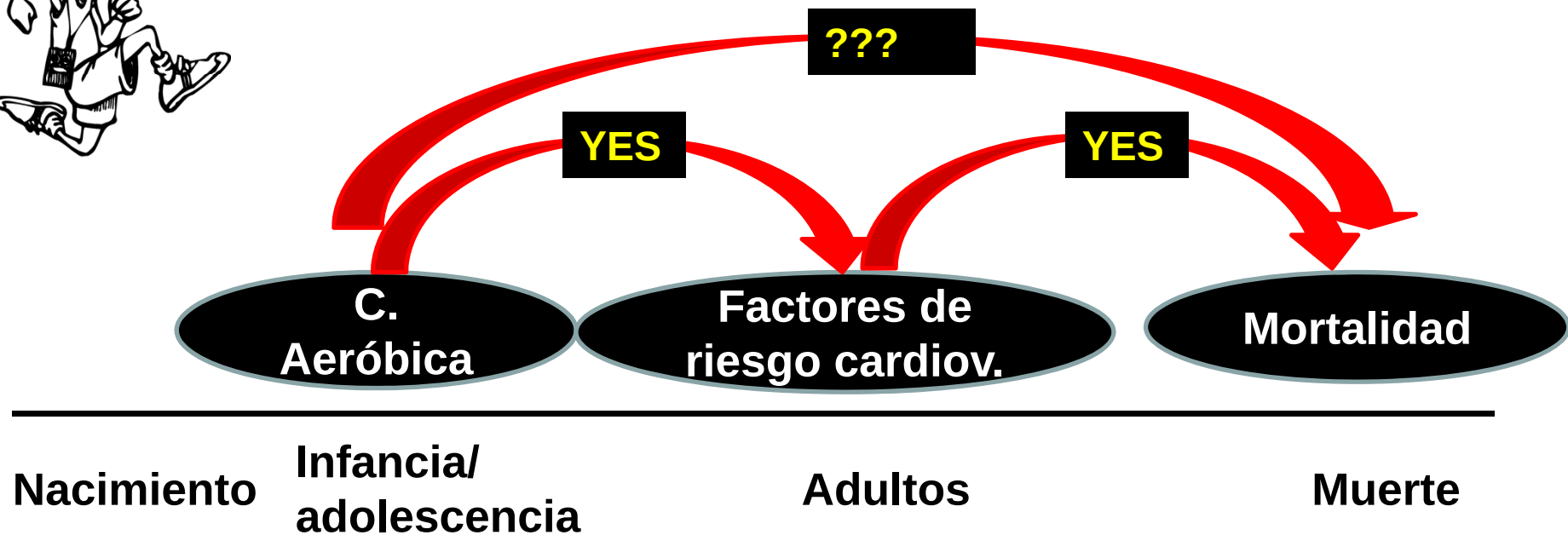
Aerobics Center Longitudinal Study. Adapted from Wei et al. 1999



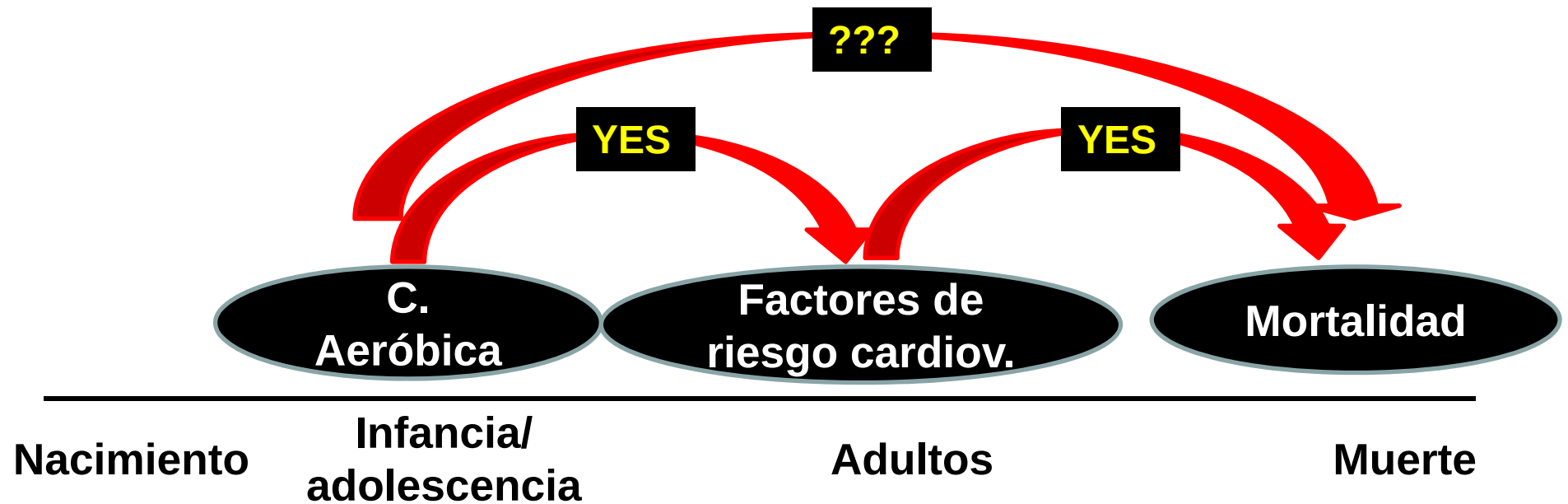
Aerobics Center Longitudinal Study. Adapted from Wei et al. 1999

1) Fuerza como predictor de mortalidad

¿Qué sabemos a día de hoy sobre capacidad cardiorespiratoria y salud?



¿Qué sabemos a día de hoy sobre **FUERZA MUSCULAR** y salud?



THE AVENA STUDY

2859 adolescents
13-18.5 years

CSIC

- Immunology
- Psychology
- General anamnesis
- Statistics



Department of Medical Physiology

- Biochemical survey
- Lipids metabolism ▪ Physical fitness
- Vitamins
- Iron metabolism
- Hormones



Department of Pediatrics

- Genetic study

UC

Department of Pediatrics

- Body Composition
- Anthropometry



Department of Physiology

- Nutrition



Department of Sports Sciences

- Physical Activity

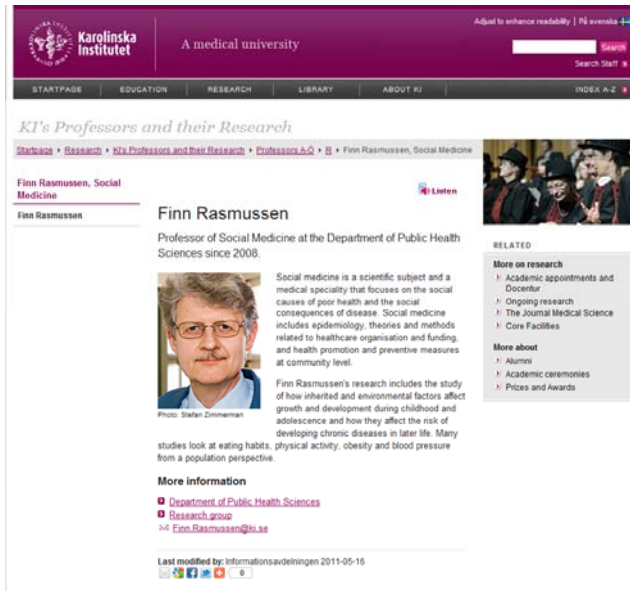


➤ HELENA Study

➤ HELENA Meeting. Granada, 2008





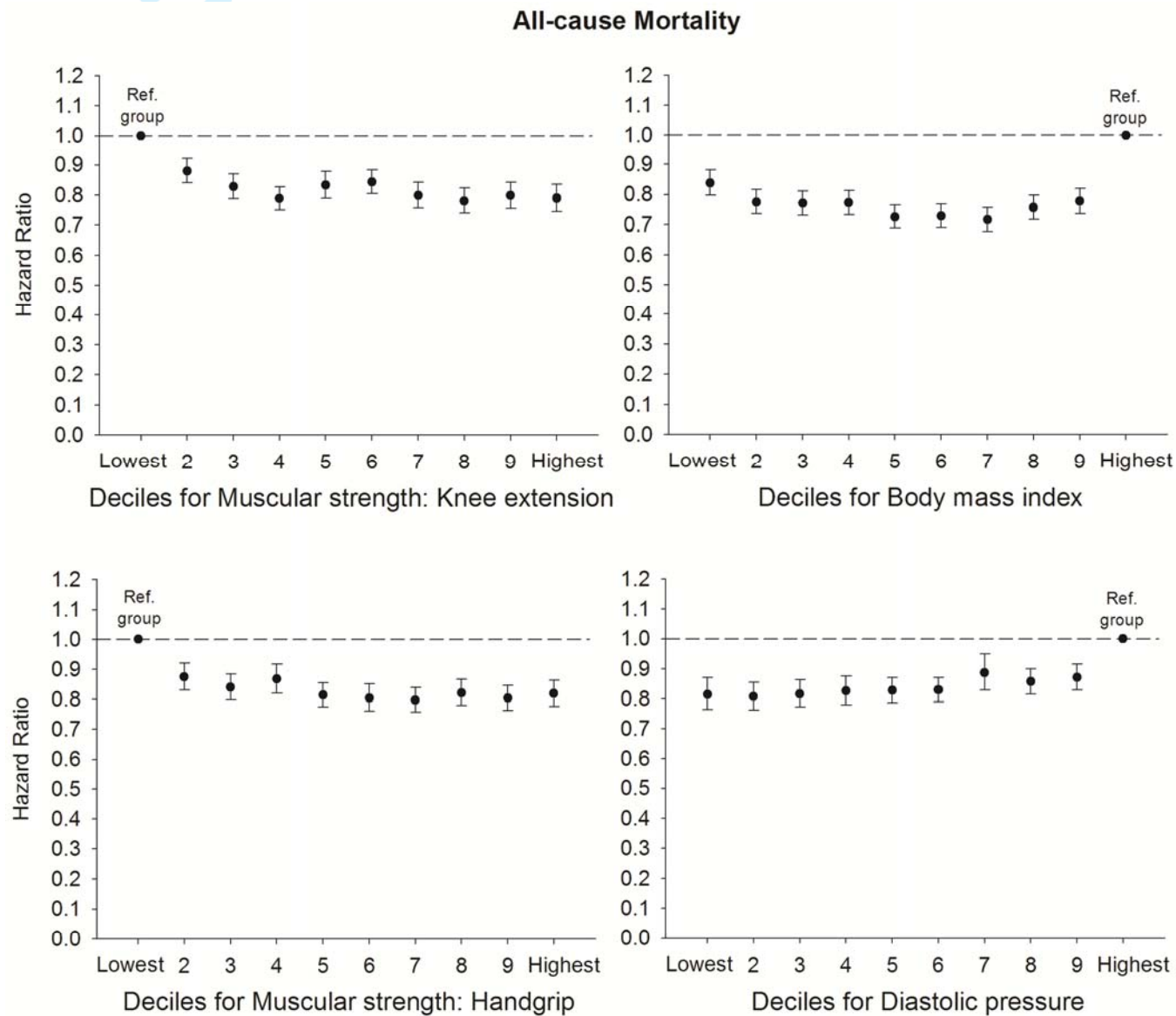


BMJ

**Muscular strength in male adolescents and premature death:
a cohort study of one million participants**

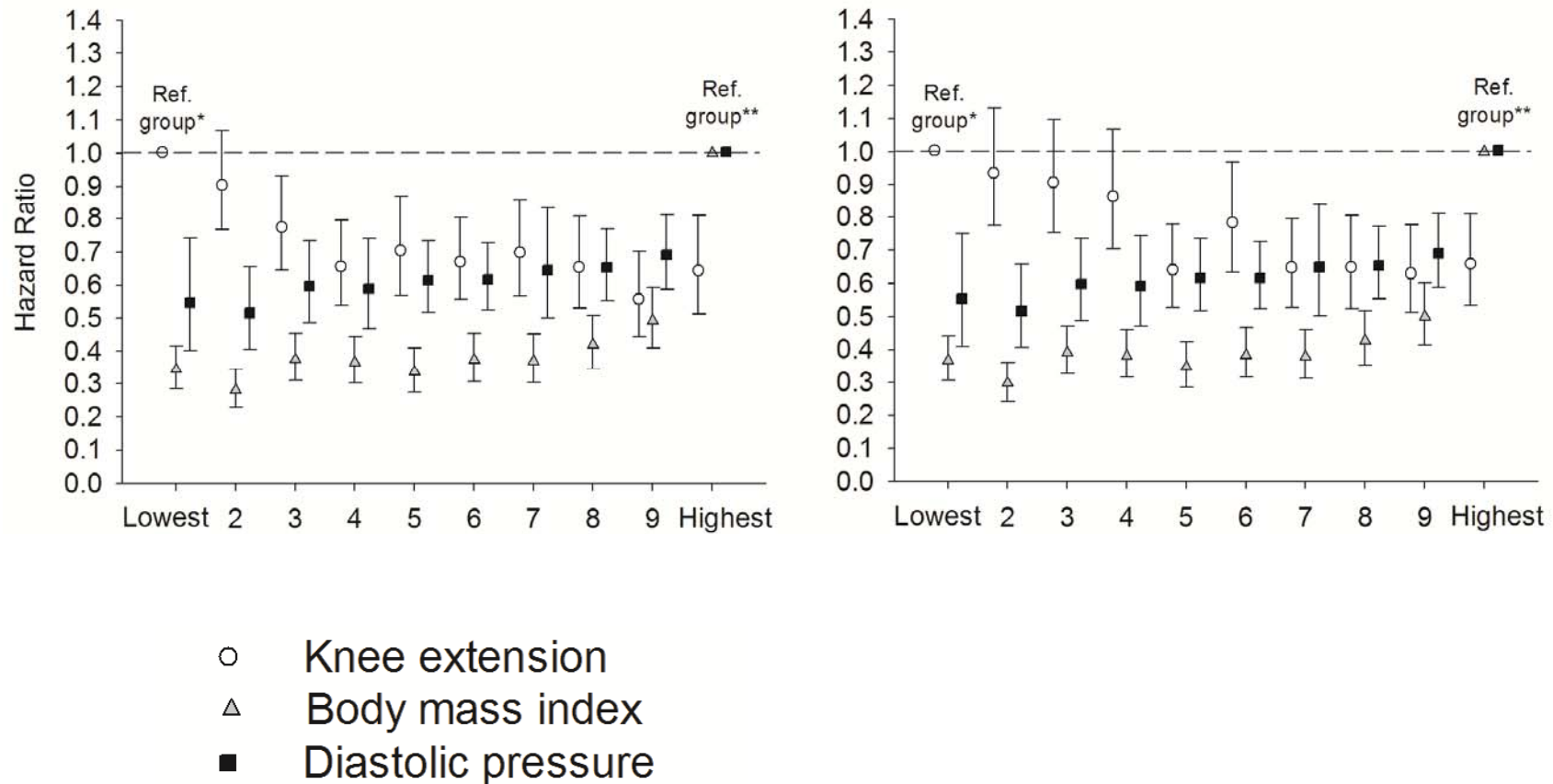
Follow-up: 24 years

Adolescent muscular strength predicts premature death: A cohort study of one million Swedish male adolescents

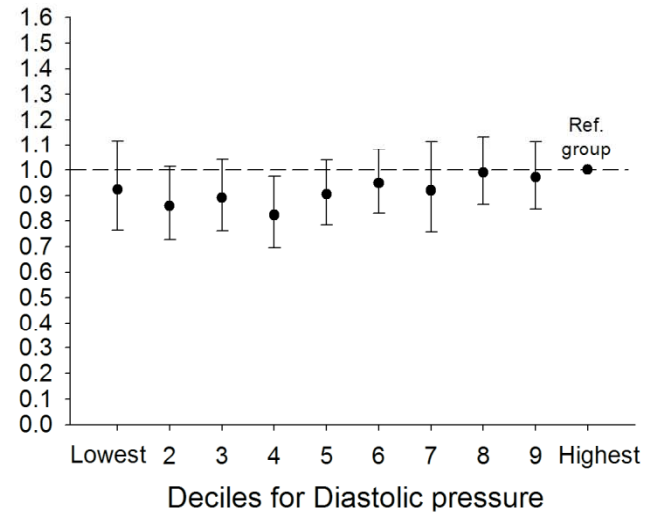
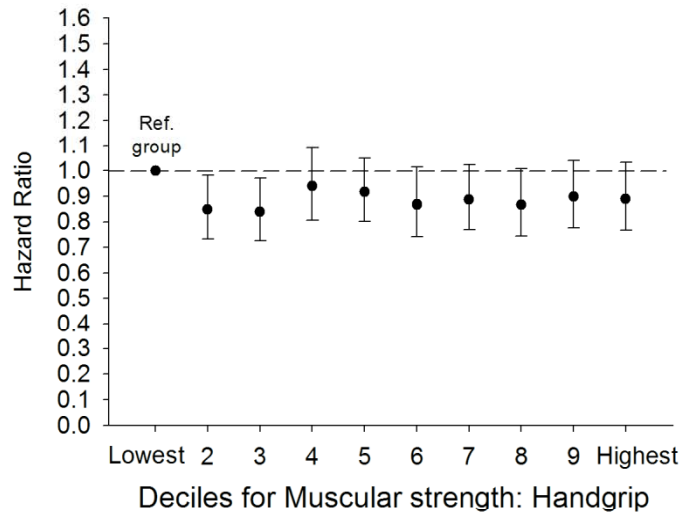
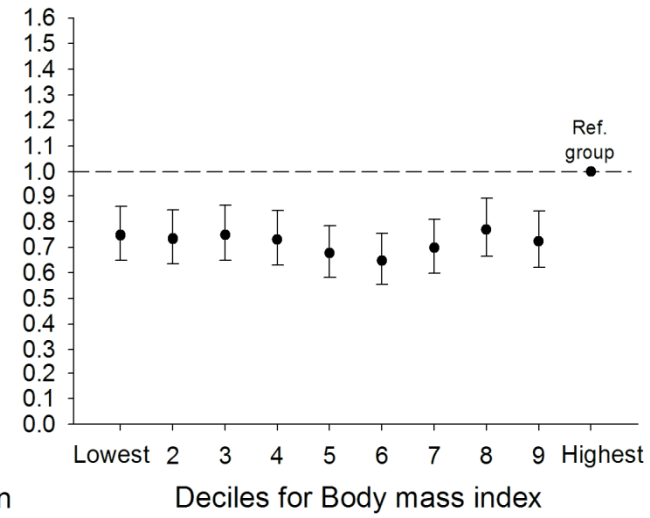
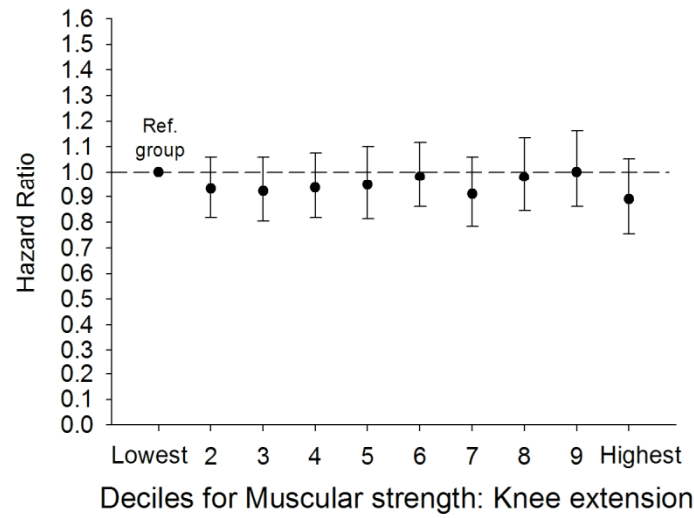


Adolescent muscular strength predicts premature death: A cohort study of one million Swedish male adolescents

Cardiovascular disease Mortality



Cancer Mortality

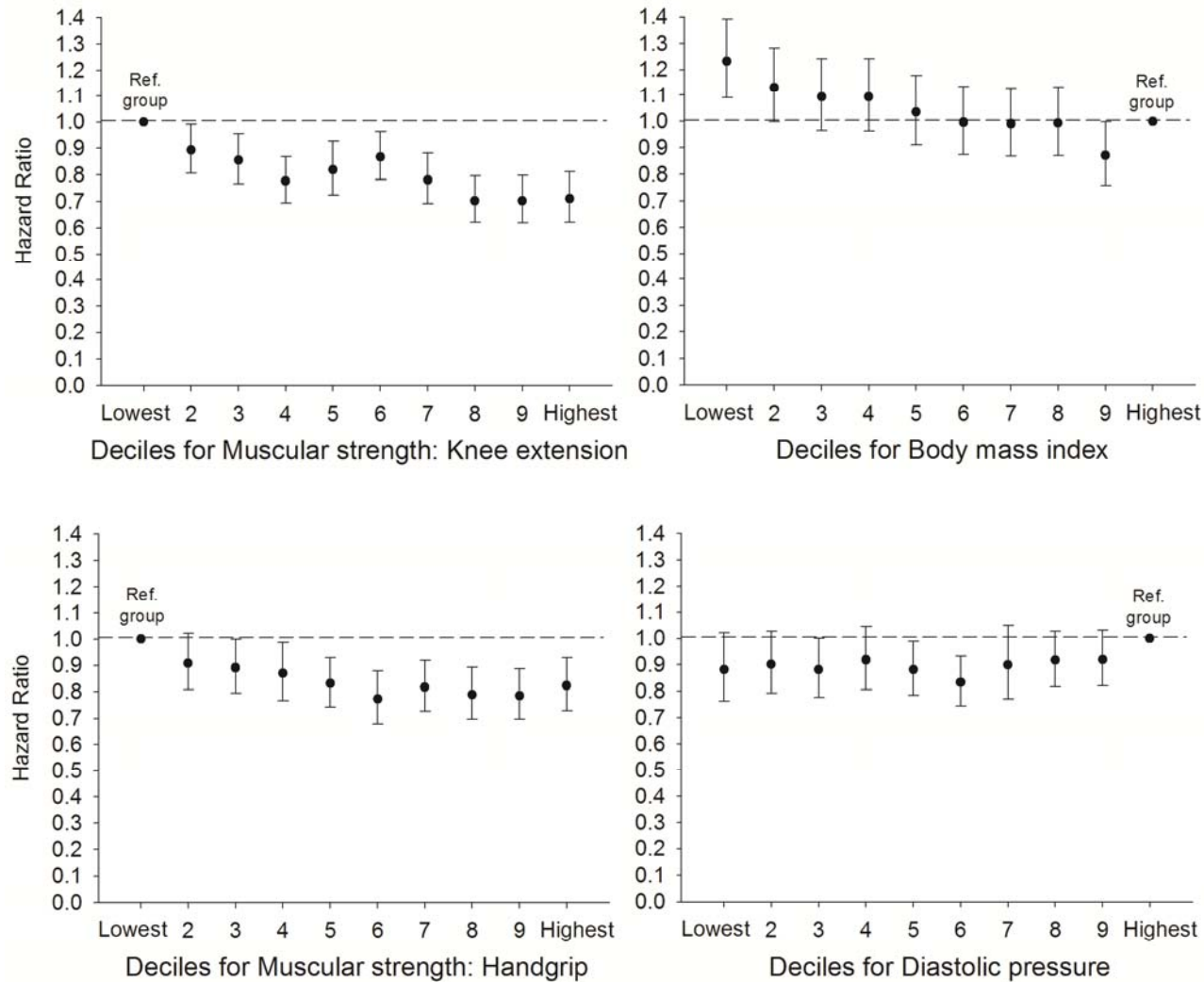


PRINCIPAL CAUSA DE
MUERTE EN PERSONAS
JÓVENES ???

SUICIDIO

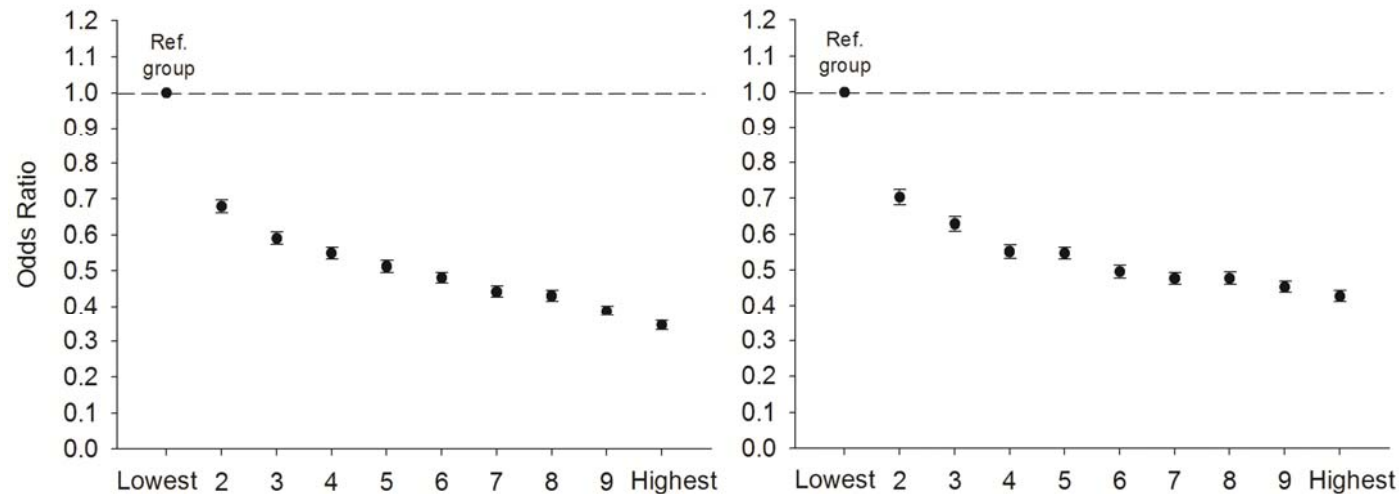
Adolescent muscular strength predicts premature death: A cohort study of one million Swedish male adolescents

Suicide Mortality

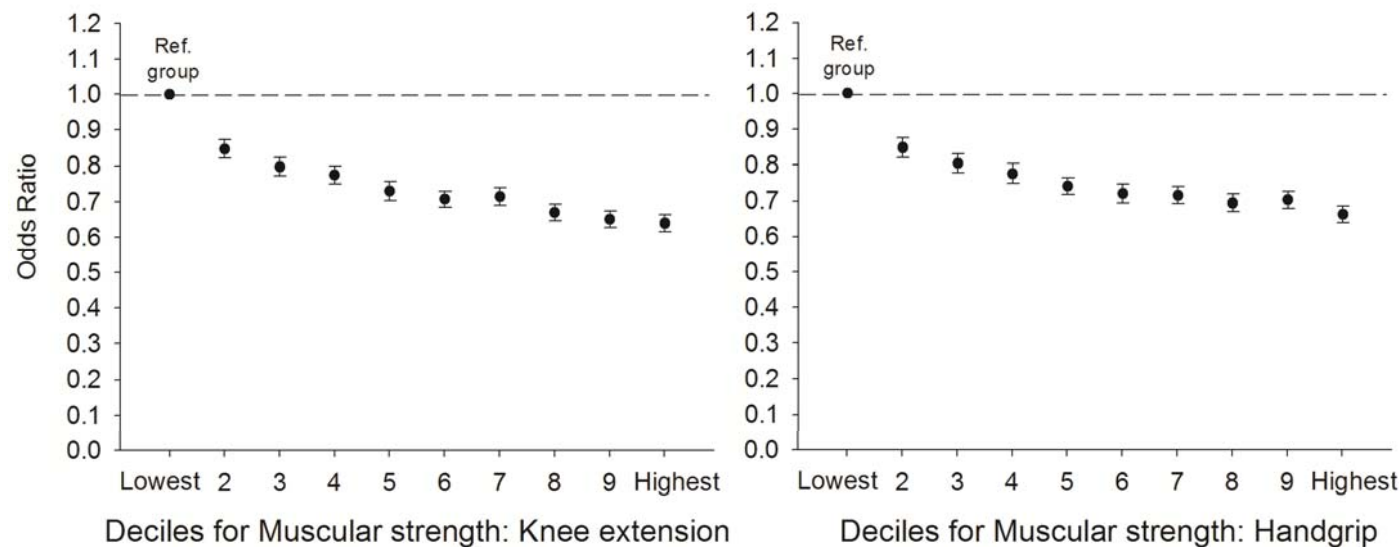


Adolescent muscular strength predicts premature death: A cohort study of one million Swedish male adolescents

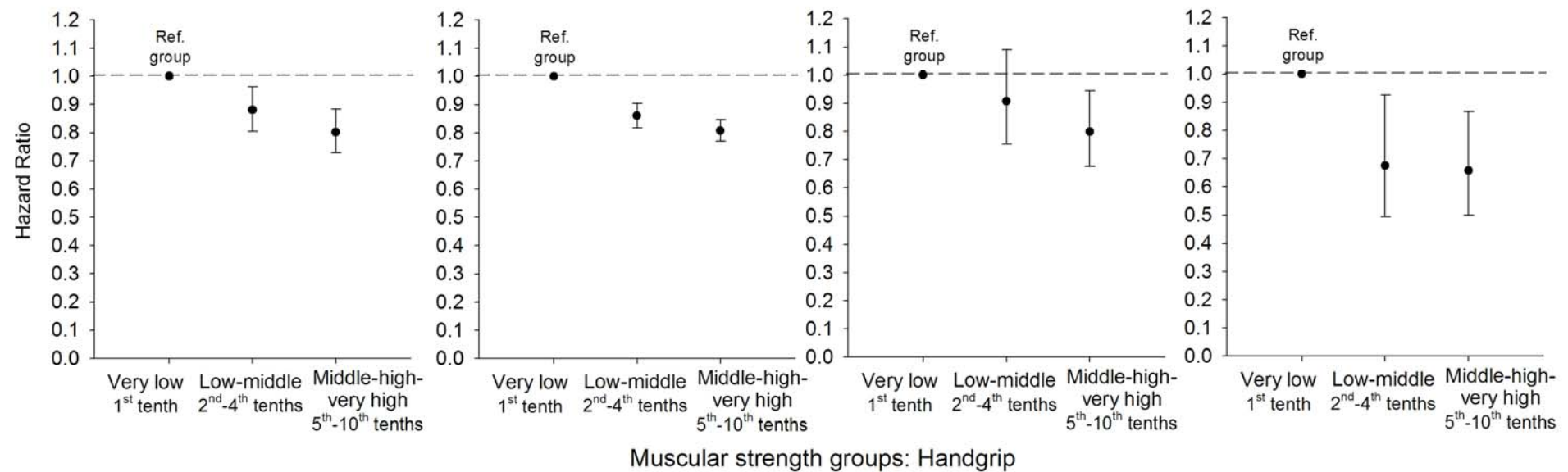
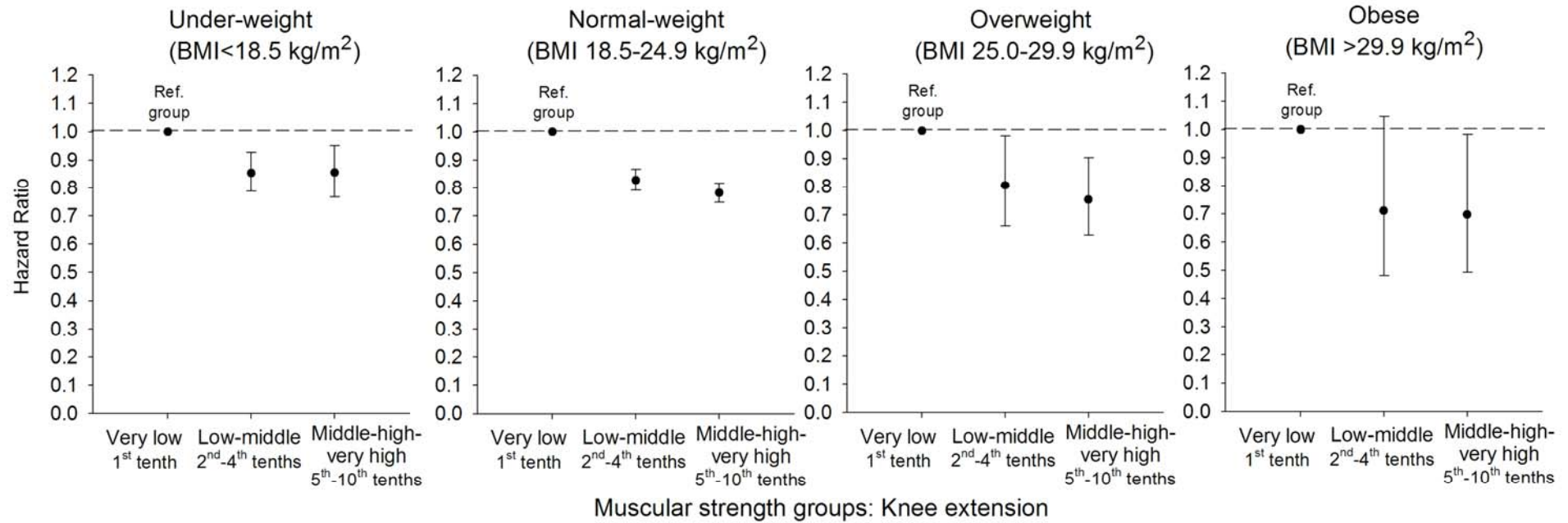
Psychiatric diagnosis at baseline (cross-sectional analysis)



Psychiatric diagnosis years later (longitudinal analysis)



All-cause mortality stratifying by BMI categories



Evaluar la condición física es importante como indicador de salud...

...pero una vez que evaluamos, qué tenemos ?

10	09	73	25	33	76	52	01	35	86	34	67	35	48	76	80	95	90	91	17
37	54	20	48	05	64	89	47	42	96	24	80	52	40	37	20	63	61	04	02
08	42	26	89	53	19	64	50	93	03	23	20	90	25	00	15	95	33	47	64
99	01	90	25	29	09	37	67	07	15	38	31	13	11	65	88	67	67	43	97
12	80	79	99	70	80	15	73	61	47	64	03	23	66	53	98	95	11	08	77
66	06	57	47	17	34	07	27	68	50	36	69	73	61	70	65	81	33	98	85
31	06	01	08	05	45	57	18	24	06	35	30	34	26	14	86	79	90	74	39
85	26	97	76	02	02	05	16	56	92	68	66	57	48	18	73	05	38	52	47
63	57	33	21	35	05	32	54	70	48	90	55	35	75	48	28	46	82	87	09
73	79	64	57	53	03	52	96	47	78	35	80	83	42	82	60	93	52	03	44
98	52	01	77	67	14	90	56	86	07	22	10	94	05	58	60	97	09	34	33
11	80	50	54	31	39	80	82	77	32	50	72	56	82	48	29	40	52	42	01
83	45	29	96	34	06	28	89	80	83	13	74	67	00	78	18	47	54	06	10
88	68	54	02	00	86	50	75	84	01	36	76	66	79	51	90	36	47	64	93
99	59	46	73	48	87	51	76	49	69	91	82	60	89	28	93	78	56	13	68
65	48	11	76	74	17	46	85	09	50	58	04	77	69	74	73	03	95	71	86
80	12	43	56	35	17	72	70	80	15	45	31	82	23	74	21	11	57	82	53
74	35	09	98	17	77	40	27	72	14	43	23	60	02	10	45	52	16	42	37
69	91	62	68	03	66	25	22	91	48	36	93	68	72	03	76	62	11	39	90
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44	10	48	19	49	85	15	74	79	54	32	97	92	65	75	57	60	04	08	81
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63	60	64	93	29	16	50	53	44	84	40	21	95	25	63	43	65	17	70	82
61	19	69	04	46	26	45	74	77	74	51	92	43	37	29	65	39	45	95	93
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94	55	72	85	73	67	89	75	43	87	54	62	24	44	31	91	19	04	25	92
42	48	11	62	13	97	34	40	87	21	16	86	84	87	67	03	07	11	20	59
23	52	37	83	17	73	20	88	98	37	68	93	59	14	16	26	25	22	96	63
04	49	35	24	94	75	24	63	38	24	45	86	25	10	26	61	96	27	93	36
00	54	99	76	54	64	05	18	81	59	96	11	96	38	96	54	69	28	23	91
35	96	31	53	07	26	89	90	93	54	33	35	13	54	62	77	97	45	00	24
59	80	80	83	91	43	42	72	68	42	83	60	94	97	00	13	02	12	48	92
46	05	88	52	36	01	39	09	22	86	77	28	14	40	77	93	91	08	36	47
32	17	90	05	97	87	37	92	52	41	05	56	70	70	07	86	74	31	71	57
69	23	46	14	06	20	11	74	52	04	15	95	66	00	00	18	74	39	24	23
19	56	54	14	30	01	75	87	53	79	40	41	92	15	85	66	67	43	68	06
45	15	51	49	38	19	47	60	72	46	43	66	79	45	43	59	04	79	00	33
94	86	43	19	94	36	16	81	08	51	34	88	88	15	53	01	54	03	54	56
59	58	00	64	78	75	56	97	88	00	88	83	55	44	86	23	76	80	61	56
38	50	80	73	41	23	79	34	87	63	90	82	29	70	22	17	71	90	42	07
30	69	27	06	68	94	68	81	61	27	56	19	68	00	91	82	06	76	34	00
65	44	39	56	59	18	28	82	74	37	49	63	22	40	41	08	33	76	56	76
27	26	75	02	64	13	19	27	22	91	07	47	74	46	06	17	98	54	89	11

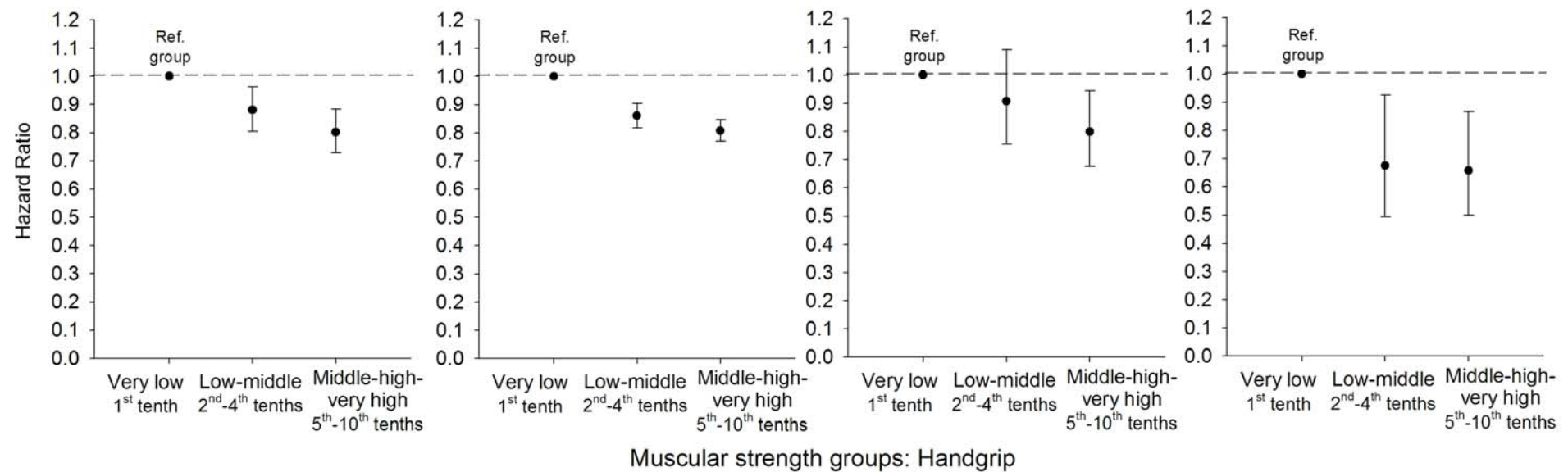
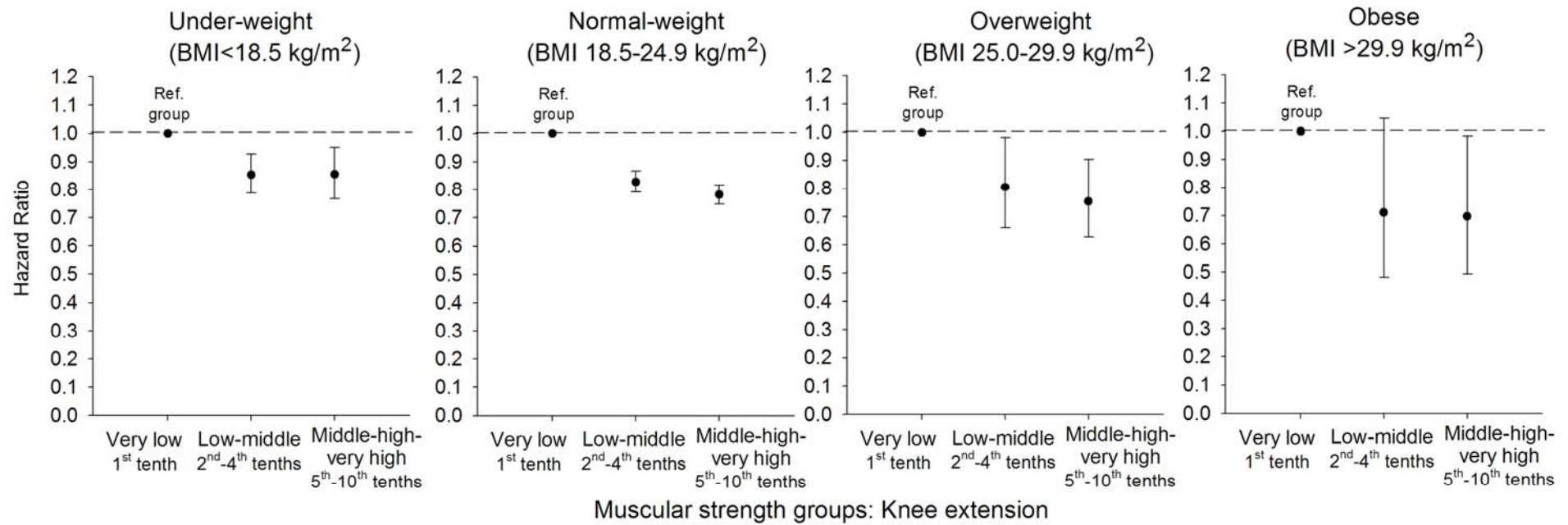


1) Valores de referencia: AVENA, HELENA...

2) Puntos de corte clínicos

3) O una combinación de ambos

All-cause mortality stratifying by BMI categories



Healthy muscular fitness zones for handgrip strength (kg) in European adolescents.

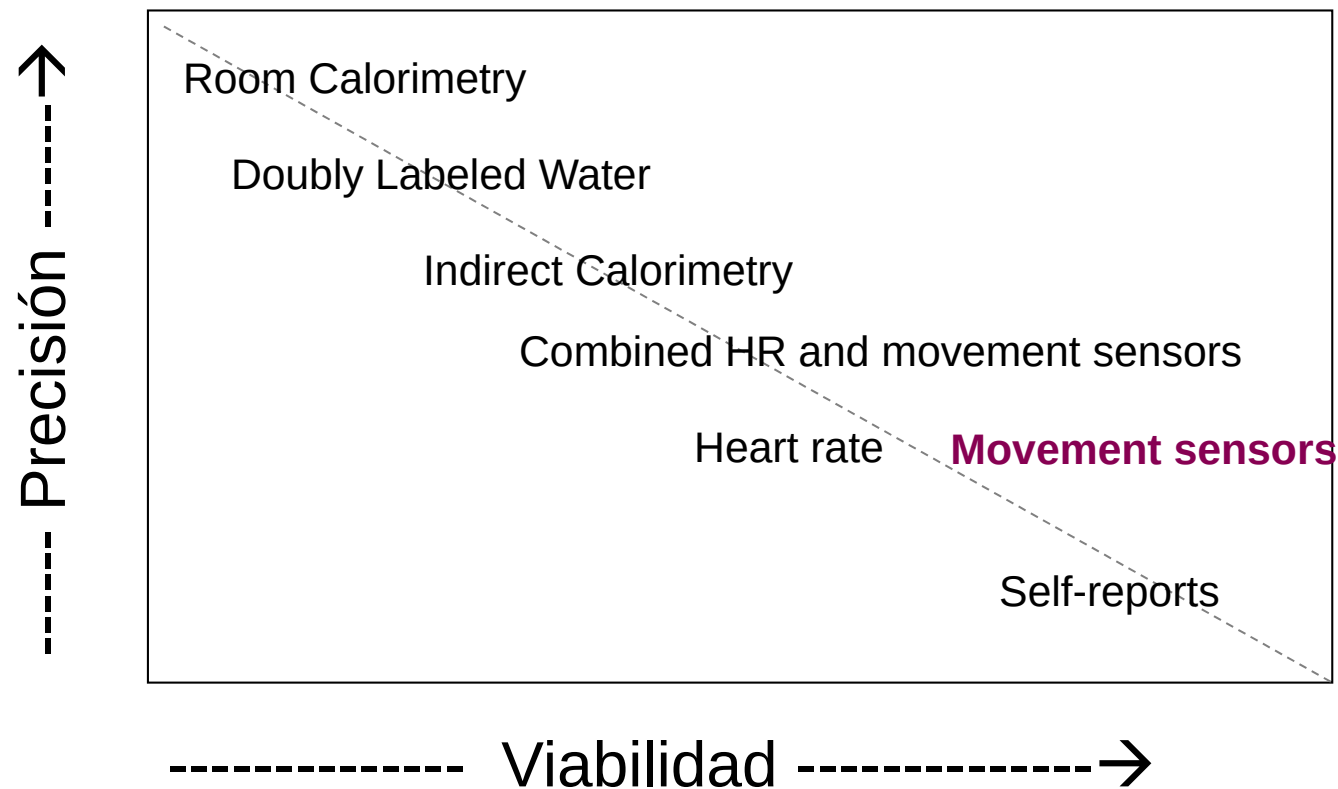
Muscular strength level	Very low strength (1 th tenth)	Low to middle strength (2 nd -4 th tenths)	Middle to very high strength (≥5 th tenth)
Associated risk	High risk zone	Healthier muscular fitness zone	Healthiest muscular fitness zone
Boys			
13 y	≤19.2	19.3 – 24.7	>24.7
14 y	≤23.4	23.5 – 30.4	>30.4
15 y	≤28.1	28.2 – 35.7	>35.7
16 y	≤33.0	33.1 – 40.0	>40.0
17 y	≤37.4	37.5 – 43.5	>43.5
Girls			
13 y	≤18.1	18.2 – 22.5	>22.5
14 y	≤19.8	19.9 – 24.1	>24.1
15 y	≤20.7	20.8 – 25.1	>25.1
16 y	≤21.2	21.3 – 25.4	>25.4
17 y	≤22.2	22.3 – 26.4	>26.4

2) Líneas de investigación futuras



SALUD

¿Cómo medimos la actividad física que hace una persona?



METODOS

```
graph TD; A[METODOS] --- B[SUBJECTIVOS]; A --- C[OBJECTIVOS]; A --- D[DE REFERENCIA / GOLD STANDAR];
```

SUBJECTIVOS

OBJECTIVOS

DE REFERENCIA /
GOLD STANDAR

Physical activity assessment

SUBJECTIVE

METHODS

Many subjective techniques are available, including:

- Cuestionarios
- Entrevistas
- Encuestas por correo
- Diarios



CUESTIONARIO INTERNACIONAL DE ACTIVIDAD FÍSICA

Estamos interesados en saber acerca de la clase de actividad física que la gente hace como parte de su vida diaria. Las preguntas se referirán acerca del tiempo que usted utilizó siendo físicamente activo(a) en los últimos 7 días. Por favor responda cada pregunta aún si usted no se considera una persona activa. Por favor piense en aquellas actividades que usted hace como parte del trabajo, en el jardín y en la casa, para ir de un sitio a otro, y en su tiempo libre de descanso, ejercicio o deporte.

Piense acerca de todas aquellas actividades **vigorosas** que usted realizó en los últimos 7 días. Actividades **vigorosas** son las que requieren un esfuerzo físico fuerte y le hacen respirar mucho más fuerte que lo normal. Piense *solamente* en esas actividades que usted hizo por lo menos 10 minutos continuos.

1. Durante los **últimos 7 días**, ¿Cuántos días realizó usted actividades físicas **vigorosas** como levantar objetos pesados, excavar, aeróbicos, o pedalear rápido en bicicleta?

_____ días por semana

☐

Ninguna actividad física vigorosa ➡ **Pase a la pregunta 3**

2. ¿Cuánto tiempo en total usualmente le tomó realizar actividades físicas **vigorosas** en uno de esos días que las realizó?

_____ horas por día

_____ minutos por día

☐

No sabe/No está seguro(a)

Physical activity assessment

DE REFERENCIA /
GOLD STANDAR

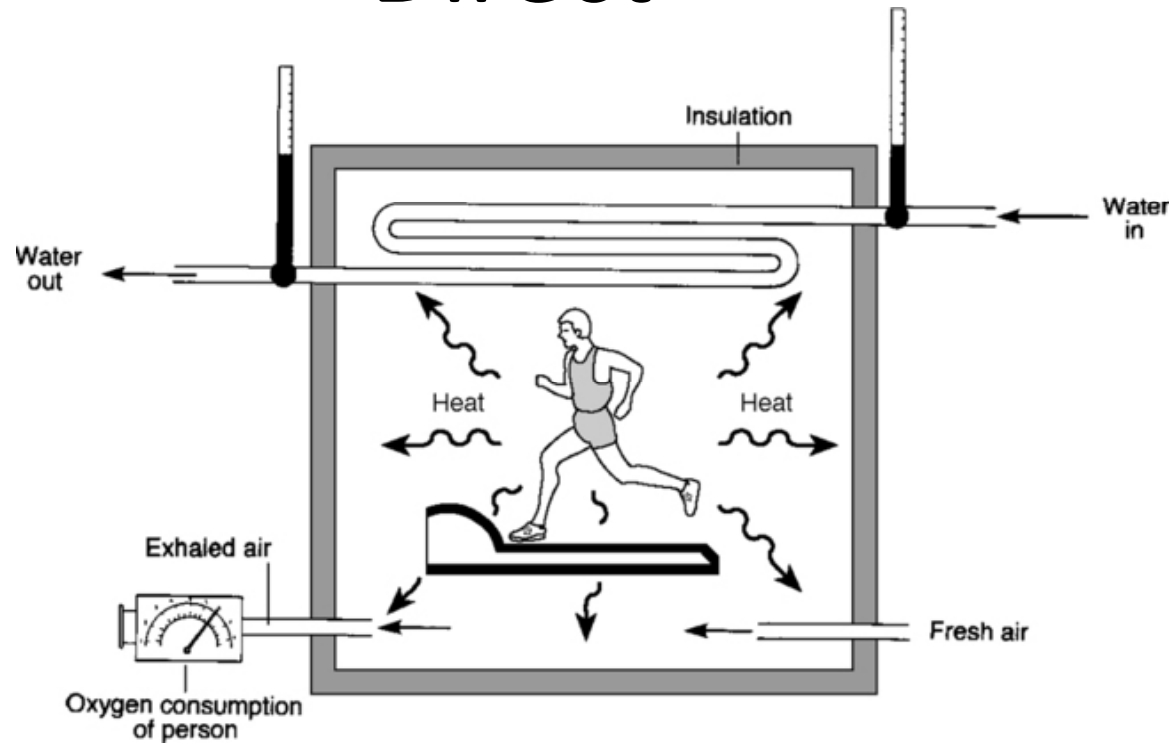
METHODS

Doubly labelled water



Calorimetry

Direct



Indirect



Physical activity assessment

OBJETIVOS

METHODS

ACELERÓMETROS



Digital and mechanical

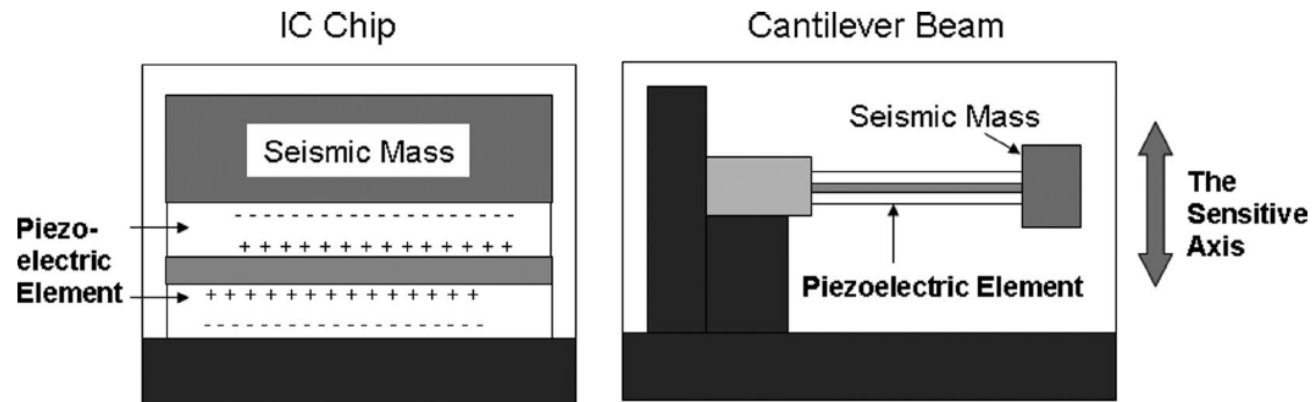


FIGURE 1—Schematic of the two common piezoelectric accelerometer configurations.



¿Cómo funciona?

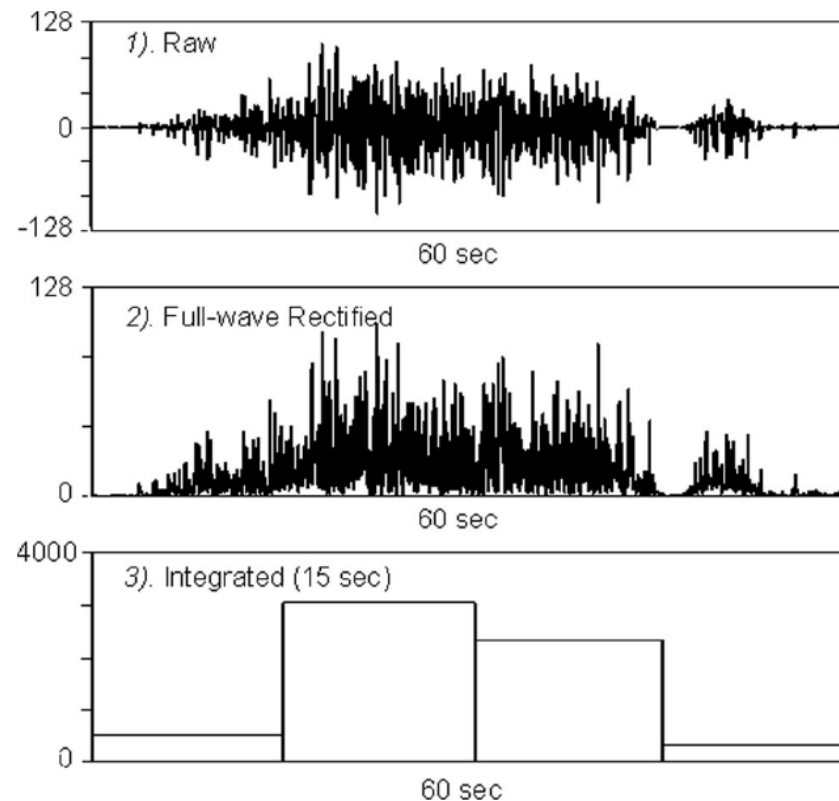
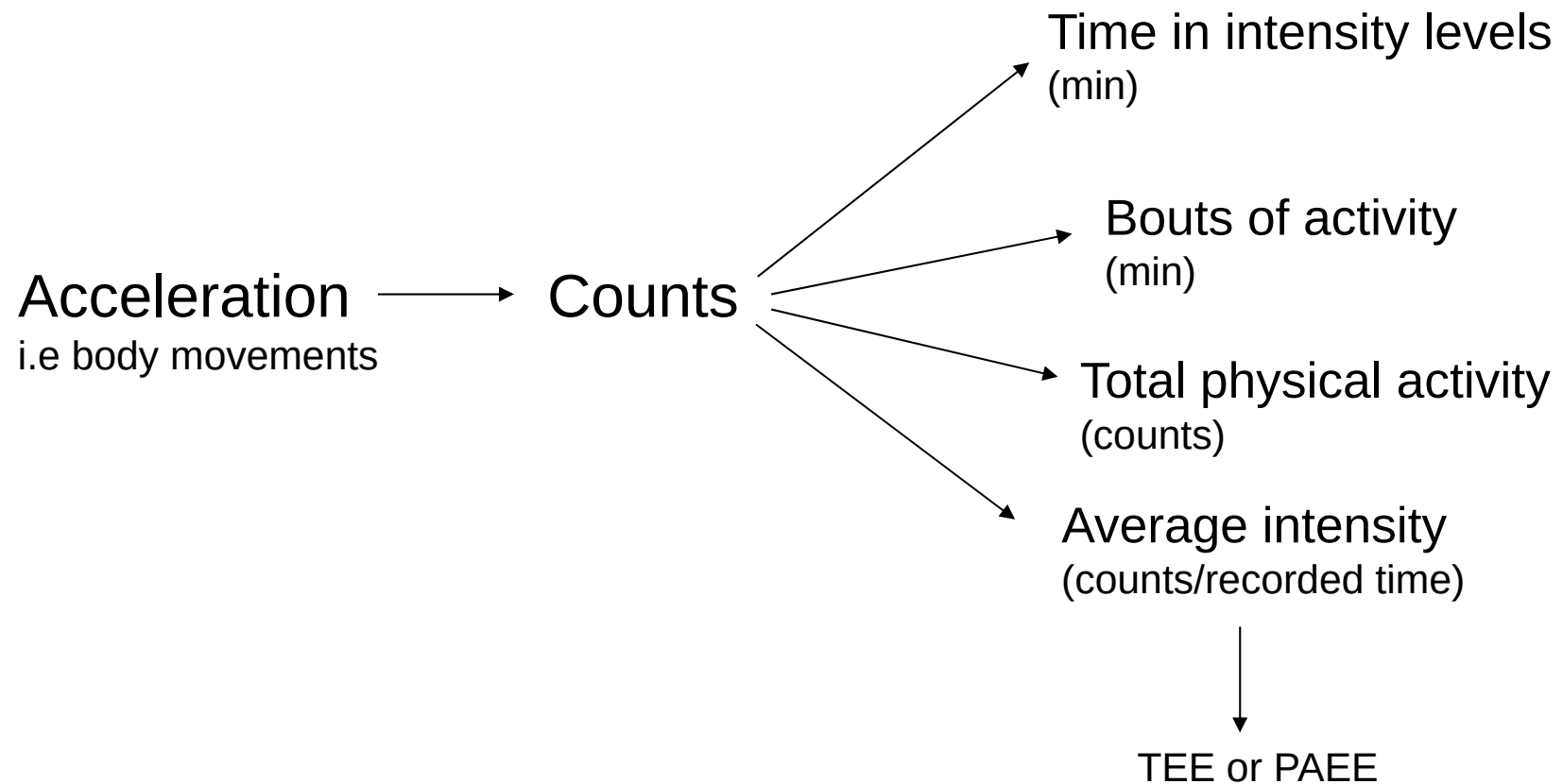


FIGURE 2—Analytical processing of the acceleration data. 1. Raw: a 60-s window of a digitized raw signal collected at 32 Hz and using a 8-bit A/D conversion. 2. Rectification: all negative signal from (1) was turned into positive. 3. Integration: 15-s epochs.

Output



¿Quién lo inventó y para qué?

1988



2001

Manufacturing Technology, Inc.
(MTI), Florida, USA

Empresa de electrónica de
sistemas aplicado a la defensa
y aeroespacio

2004



<http://www.actigraphcorp.com/>



DREAM TEAM !

Prev/Nut



From left (up-down) to right: Idoia, Dirk, David, Virginia, Pedro, Fran, Diego, Pablo, David, Carmen, Jonatan, Dani, Pia, Vanes, Ana, Miguel, Manolo, Rocio, Signe, Pepe, German, Olle

Importancia de mantenerse en forma

[LINK](#)

A photograph of a person standing in a high-altitude, arid landscape. The person is wearing a bright red jacket, black pants, and a blue scarf, with their arms raised in a celebratory gesture. They are standing on a rocky, reddish-brown ground. In the background, a large mountain rises, its upper slopes covered in snow and its lower slopes showing distinct horizontal layers of red and brown rock. The sky is a clear, deep blue.

**¡GRACIAS POR SU
ATENCIÓN!**

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