



Who Arrests and Why?

The Epidemiology and Survivorship of Cardiac Arrest in Pregnancy

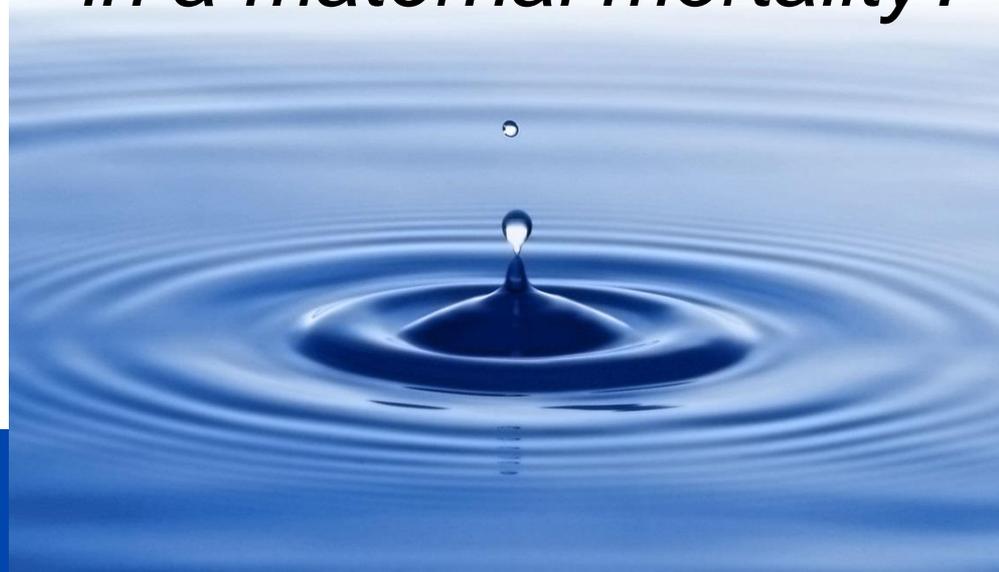
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Cardiac Problems in Pregnancy
Sunday, February 28, 2016 11:10 – 11:25am



The Question to Focus Us:

How many in this room have been involved in a maternal mortality?



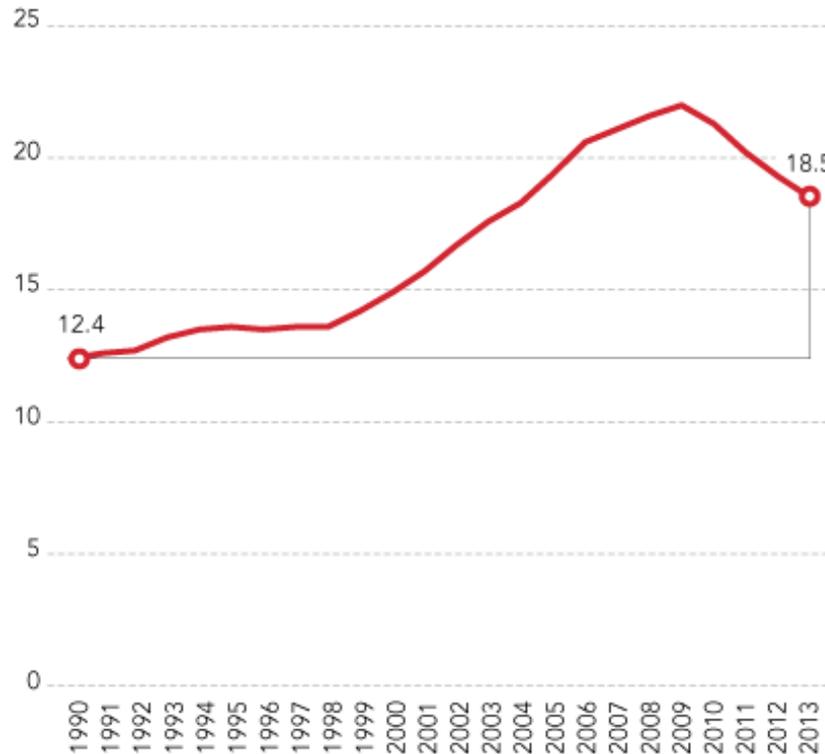


The U.S. Is The Only Developed Nation With A Rising Maternal Mortality Rate

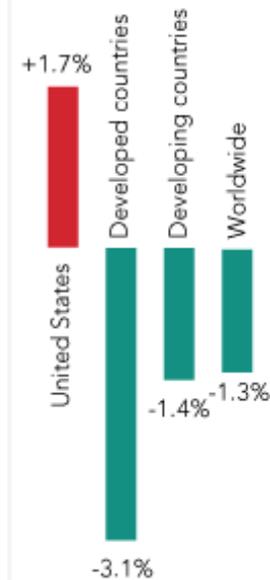
Posted: 05/19/2014 8:12 am EDT | Updated: 05/19/2014 9:59 pm EDT

U.S. Sees Biggest Increases In Maternal Death Rates In Developed World Since 1990

U.S. maternal mortality ratio per 100,000 live births, 1990-2013



Percent change in maternal deaths per 100,000 live births, 1990-2013



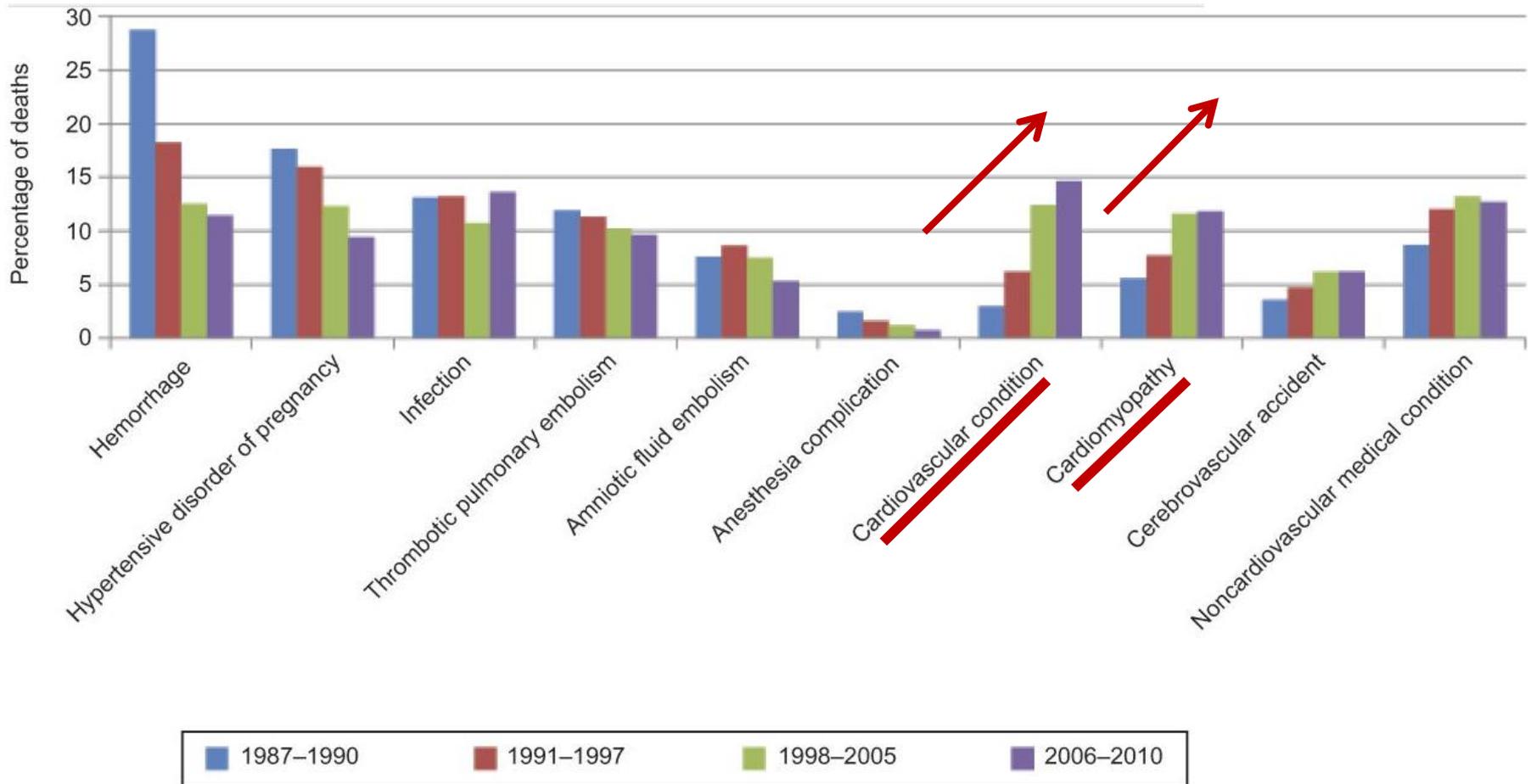
Country	MMR ^a					% change in MMR between 1990 and 2013 ^b	Average annual % change in MMR between 1990 and 2013 ^b	Range of uncertainty on annual % change in MMR		Progress towards improving maternal health ^c
	1990	1995	2000	2005	2013			Lower estimate	Upper estimate	
Tunisia	91	81	65	55	46	-50	-3	-3.4	-2.5	–
Turkey	48	39	33	27	20	-57	-3.6	-4	-3.2	–
Turkmenistan	66	79	81	76	61	-7	-0.3	-4.3	3.9	–
Uganda	780	740	650	510	360	-53	-3.2	-3.6	-2.9	making progress
Ukraine	49	45	35	25	23	-54	-3.3	-4	-2.5	–
United Arab Emirates	16	13	11	8	8	-53	-3.3	-7.2	1	–
United Kingdom	10	11	11	12	8	-24	-1.2	-3.1	0.8	–
United Republic of Tanzania	910	890	770	610	410	-55	-3.5	-3.7	-3.1	making progress
United States of America	12	11	13	17	28	136	3.8	1.8	5.8	–
Uruguay	42	34	35	32	14	-67	-4.8	-6.3	-3.1	–
Uzbekistan	66	54	48	44	36	-45	-2.6	-3	-2.2	–
Vanuatu	170	140	120	100	86	-49	-2.9	-6.8	1.4	making progress

Maternal mortality and morbidity in the United States of America

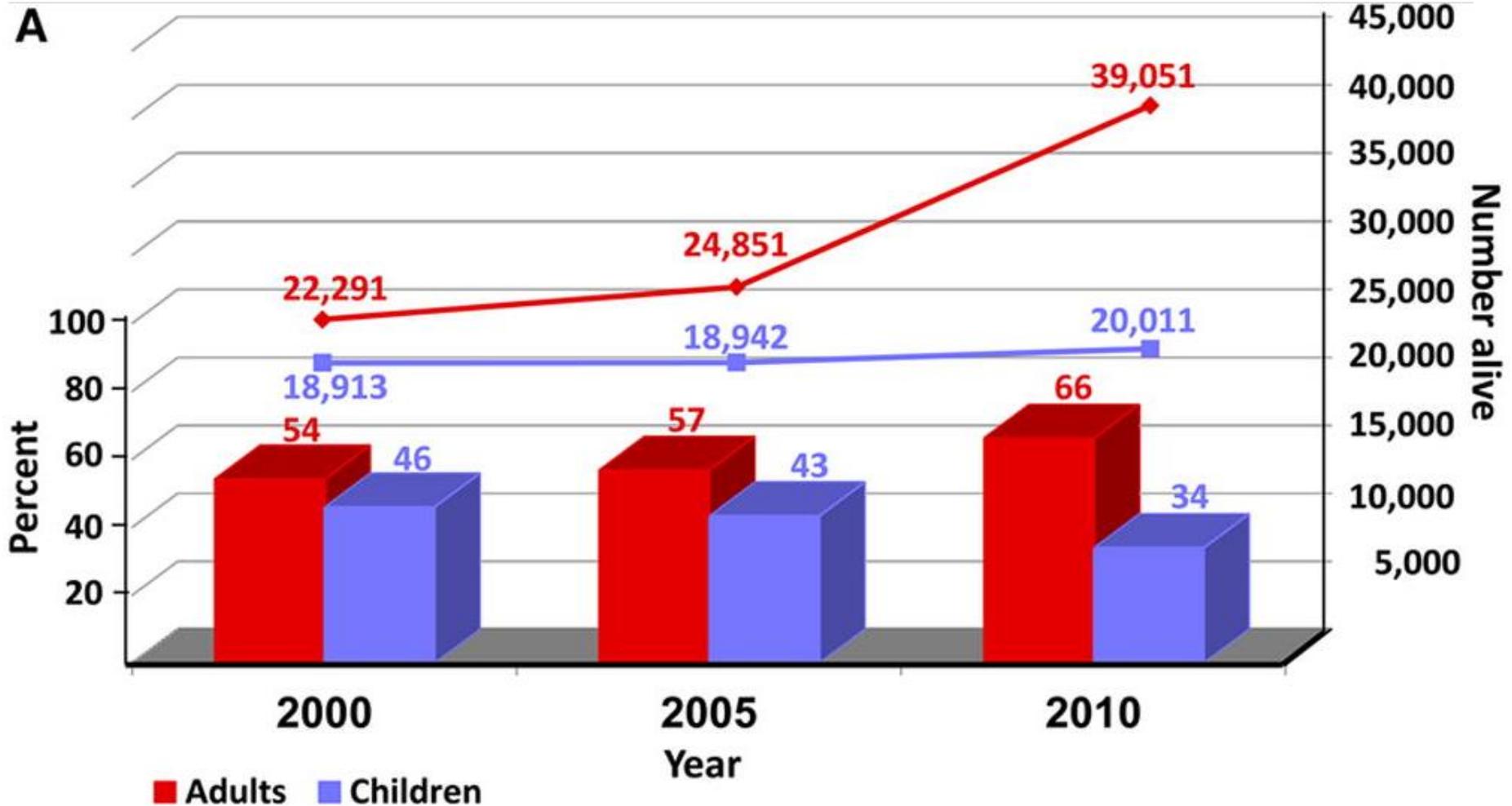
Priya Agrawal^a

Although considered mainly as problems of the developing world, maternal mortality and morbidity remain a challenge in the United States of America (USA).¹ Between 1990 and 2013, the maternal mortality ratio for the USA more than doubled from an estimated 12 to 28 maternal deaths per 100 000 births¹ and the country has now a higher ratio than those reported for most high-income countries and the Islamic Republic of Iran, Libya and Turkey.² About half of all maternal deaths in the USA are preventable.²

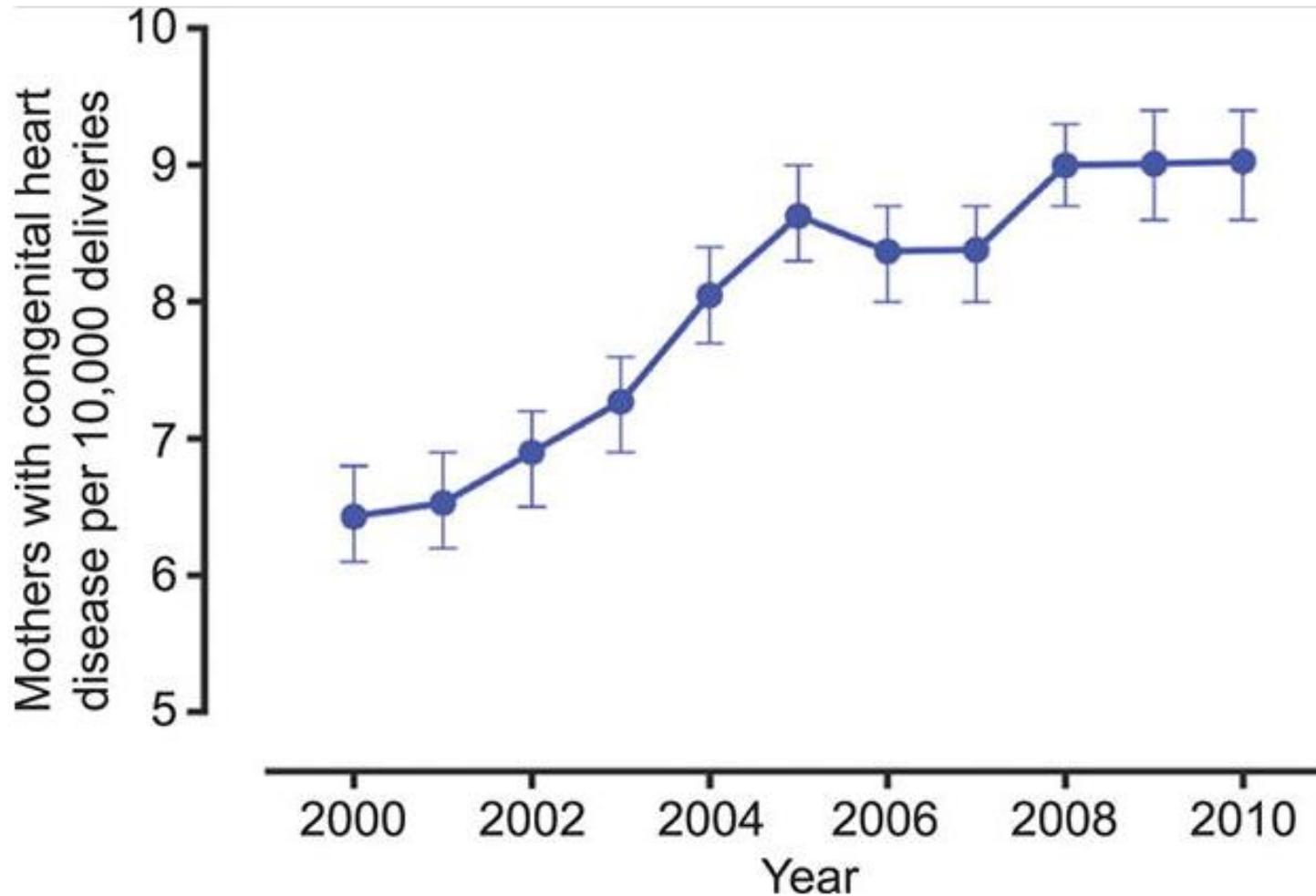
Cause-specific proportionate pregnancy-related mortality: United States, 1987–2010



Prevalence of CHD in adults



Delivery hospitalizations among women with CHD per 10,000 deliveries



Acquired heart disease in pregnancy

UK Maternal Mortality from AHD:

1996: **3.8 deaths** per million maternities



2008: **21.8 deaths** per million maternities

Increasing maternal:

Age, Obesity, Chronic hypertension

Risk for Arrest in Pregnancy

Incidence and causes of maternal cardiac arrest?

National Inpatient Sample (U.S.):

- 56,900,512 deliveries, 1998-2011
- 4,843 cardiac arrests
- 8.5 per 100,000 → **1 in 12,000**



Causes of Arrest in Pregnancy

Postpartum hemorrhage	28%
Antepartum hemorrhage	17%
Heart failure	13%
Amniotic fluid embolism	13%
Sepsis	11%
Anesthesia complications	8%
Aspiration pneumonitis	7%
Venous thromboembolism	7%
Eclampsia	6%



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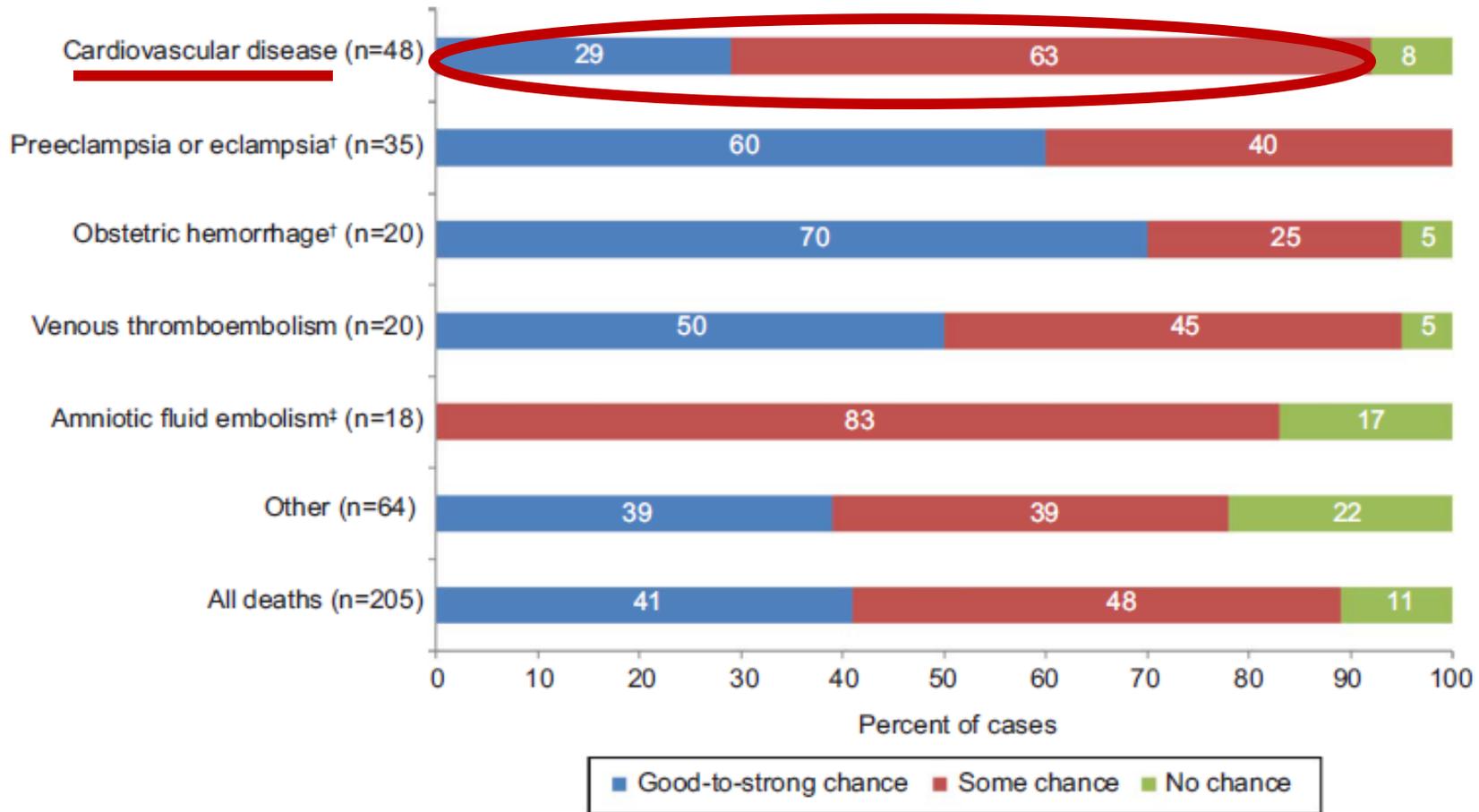
Risk for Arrest in Pregnancy

<u>Medical condition</u>	<u>adjusted OR</u>
Pulmonary hypertension	13.3
Malignancy	12.5
Ischemic heart disease	7.6
Liver disease	5.5
Congenital heart disease	4.2
Systemic lupus	4.1
Cardiac valvular disease	3.8

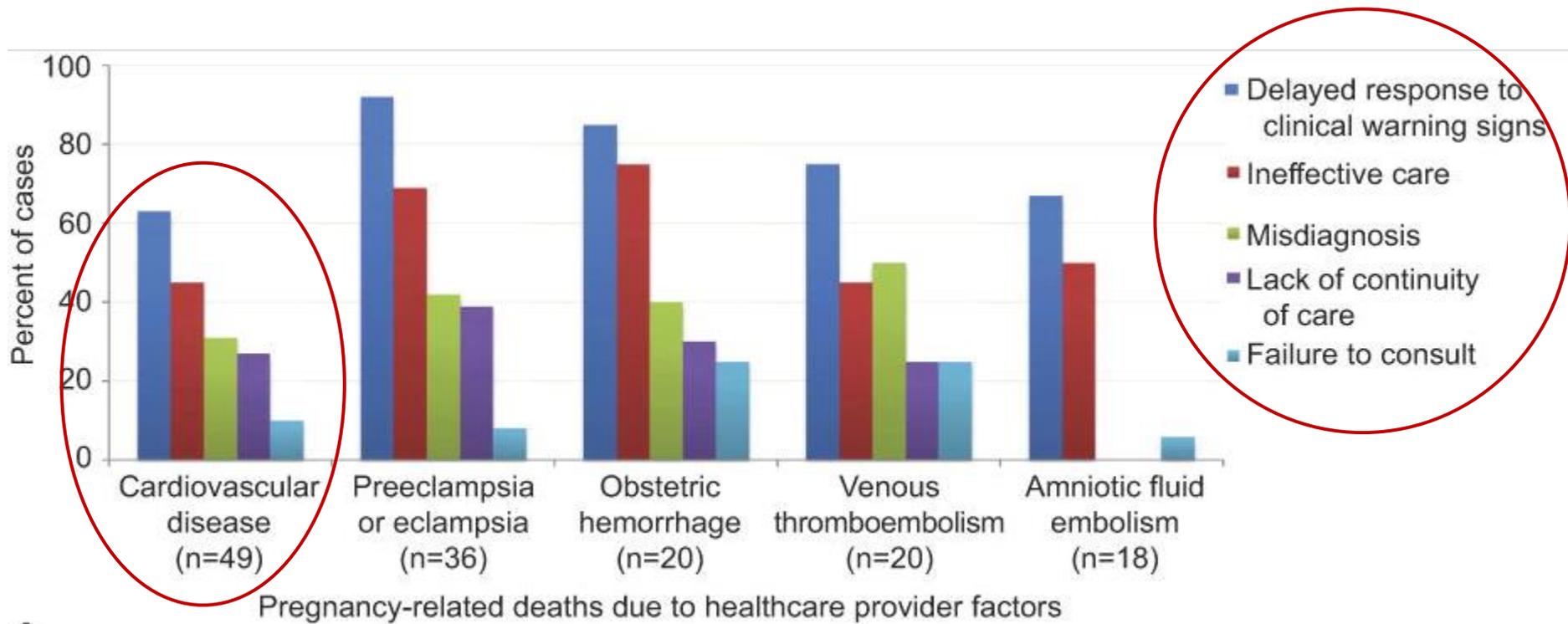
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Chance to alter outcome among causes of pregnancy related death (n = 205*), California, 2002–2005.

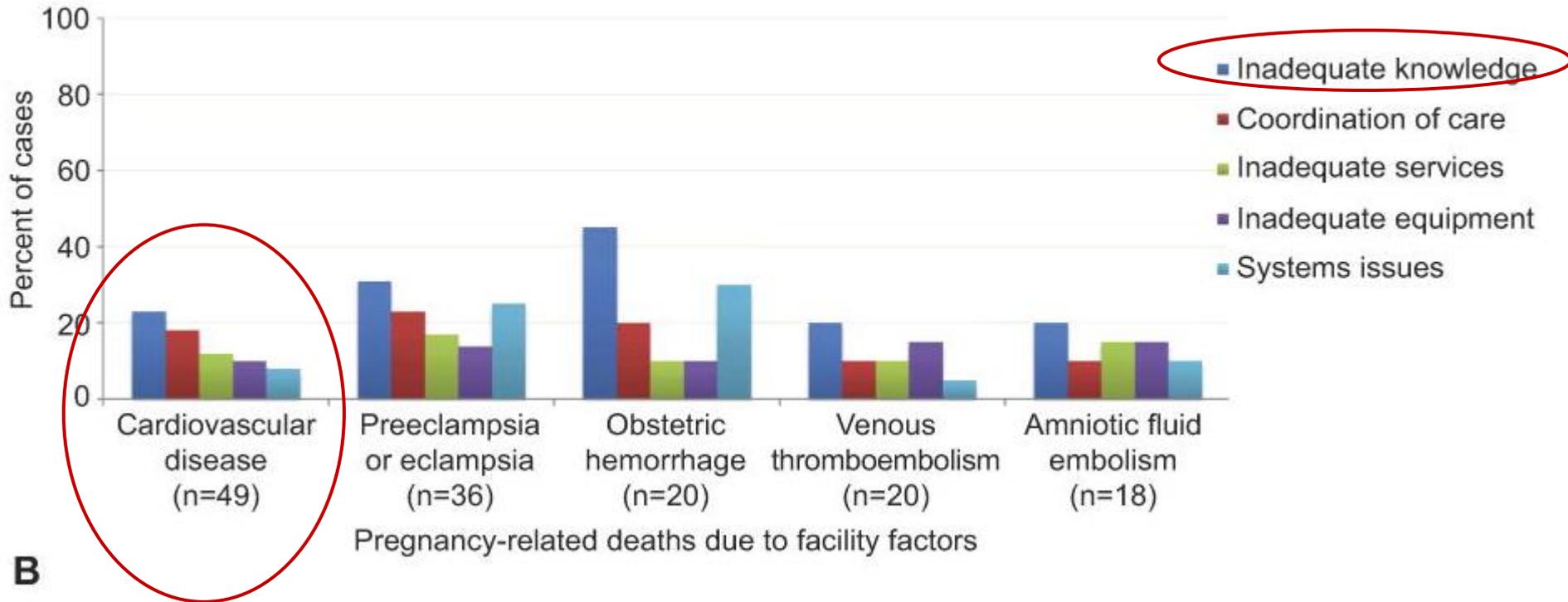


Pregnancy-related deaths due to healthcare provider factors



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Pregnancy-related deaths due to facilities factors





Thank you!

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