

# CMV AWARENESS – WHAT ARE WE REALLY MEASURING?

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## Introduction

The **congenital cytomegalovirus (cCMV) awareness gap** refers to the marked difference between the relatively high prevalence of cCMV and women's low awareness of it (Fig 1).

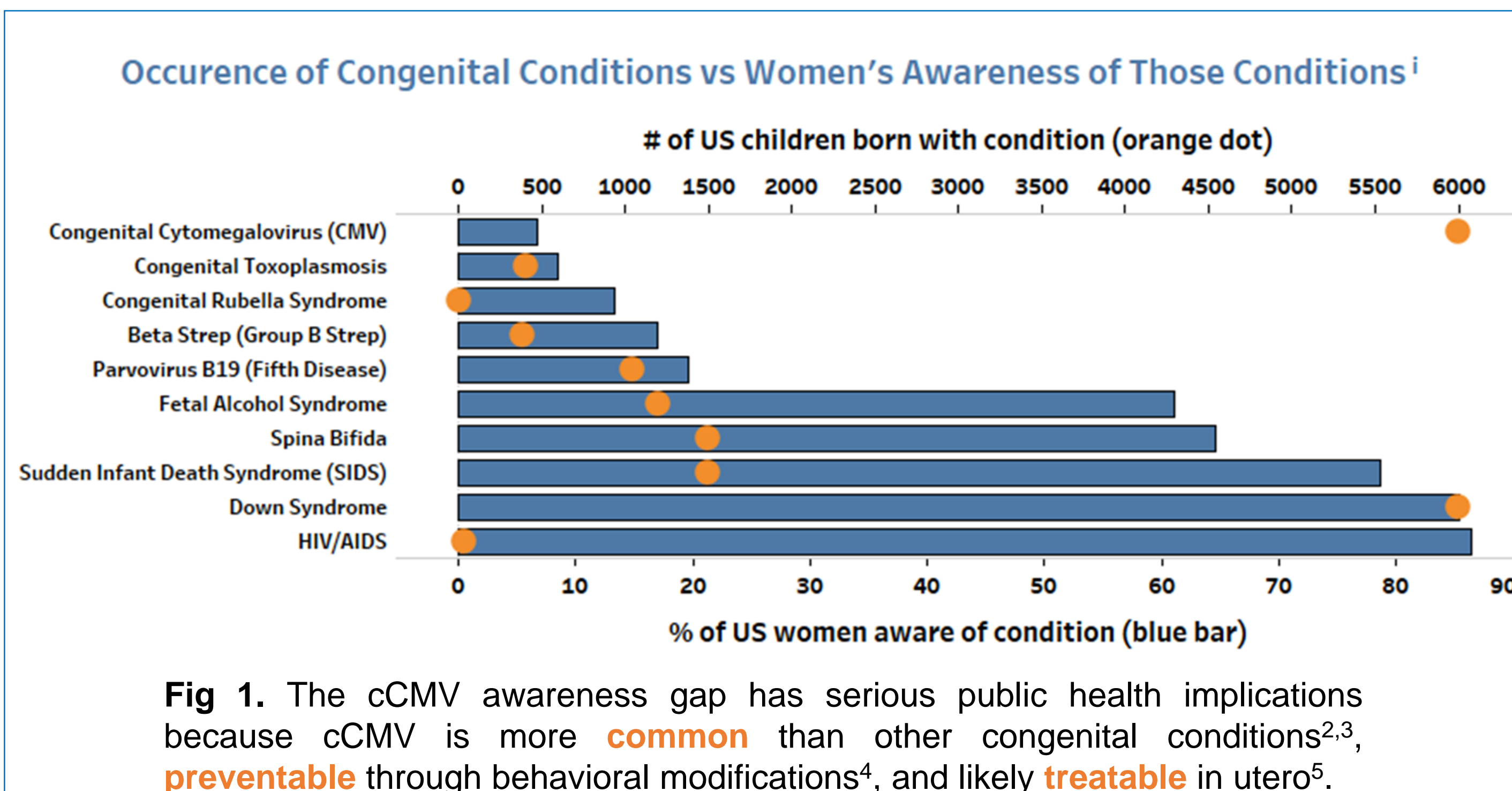


Fig 1. The cCMV awareness gap has serious public health implications because cCMV is more **common** than other congenital conditions<sup>2,3</sup>, **preventable** through behavioral modifications<sup>4</sup>, and likely **treatable** in utero<sup>5</sup>.

The awareness gap may be larger than we think. Previous studies of CMV awareness<sup>1,6-9</sup> likely overestimate CMV knowledge due to:

- **Social desirability bias**<sup>6</sup> – participants often exaggerate responses in self-report studies in a manner that would be viewed favorably by others
- **Awareness is not knowledge** – participants may have heard of or recognize a topic from a list, yet be unable to describe anything meaningful about it.

### OBJECTIVES:

1. Define and describe health risk knowledge (HRK) vs self reported familiarity (SRF) of CMV
2. Estimate levels of HRK of CMV in previous studies based on Monte Carlo simulation

## SRF vs HRK

- **Self Reported Familiarity (SRF)** – measures awareness by asking how familiar survey participants are with CMV on a four-point Likert scale (very familiar, somewhat familiar, not very familiar, never heard of this). Participants who respond as very familiar or somewhat familiar are grouped into the category “high SRF of CMV.” We report the % of participants from Muldoon et al. 2017 with high SRF for various conditions in Fig 2.

- **Health Risk Knowledge (HRK)** – measures actionable knowledge by asking survey participants to correctly identify all behavioral modes of CMV transmission (kissing, contact with wet diapers, sharing eating utensils, sharing food and/or drink, handling children's toys) in response to the question “By which of the following behaviors can people contract or spread cytomegalovirus (CMV) infection?” Participants who correctly identify all six behavioral modes of transmission are grouped into the category “high HRK of CMV.” We report the % of participants from Muldoon et al. 2017 with high HRK of CMV in Table 1.

According to Muldoon et al. 2017, 52% of PTs and OTs have high SRF of CMV, but only 18% have high HRK. This is a 65% relative difference in familiarity vs actionable knowledge of CMV.

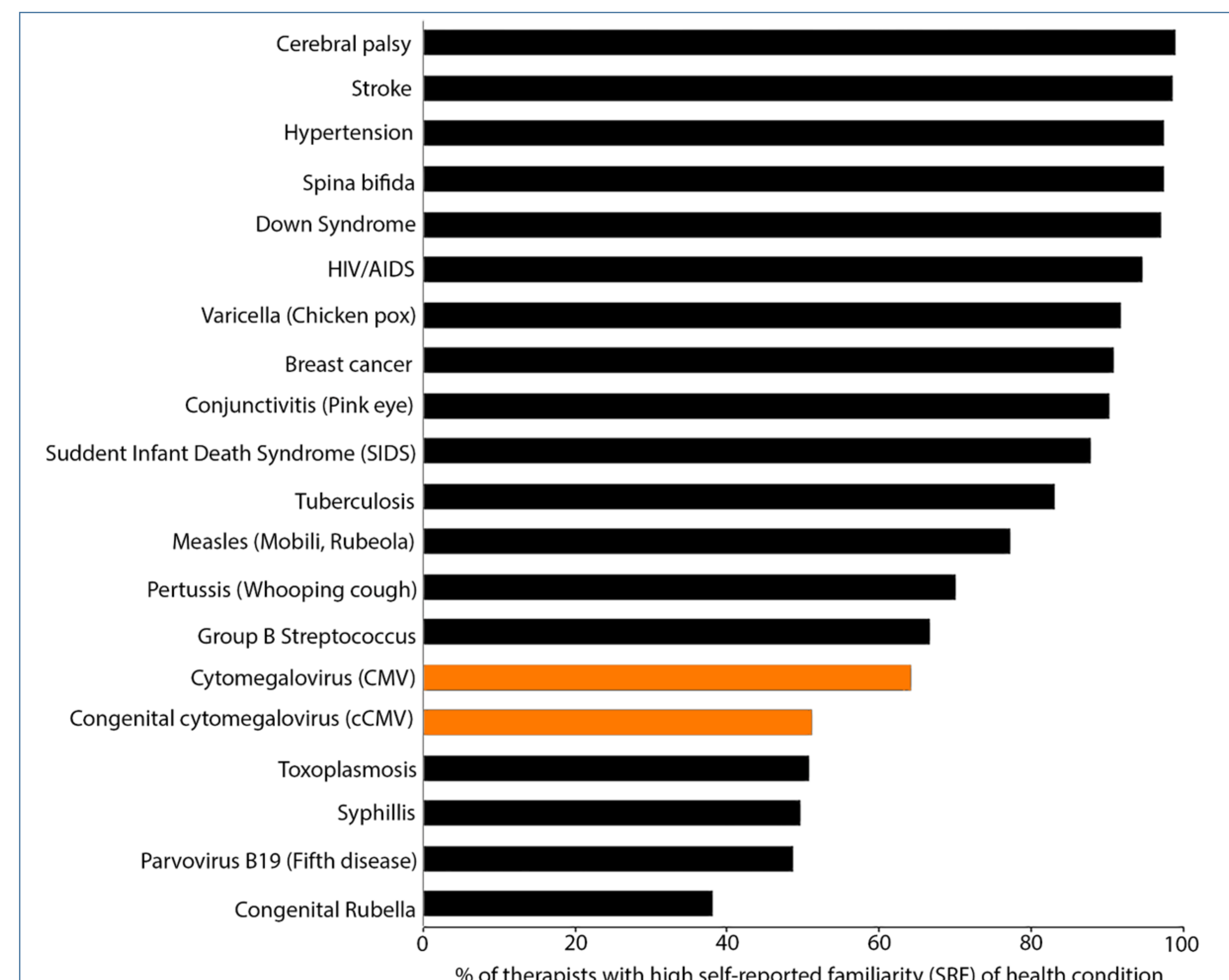


Fig 2. Awareness measured as high self-reported familiarity (SRF) of chronic and acute health conditions among physical and occupational therapists<sup>7</sup>

Table 1. Self-reported familiarity (SRF) and health risk knowledge (HRK) of cCMV among physical and occupational therapists (N=230)<sup>7</sup>

	N	SRF N (%)	HRK N (%)
PTs	176 (81.9)	91 (55.5)	28 (18.9)
OTs	39 (18.2)	10 (38.5)	3 (11.1)

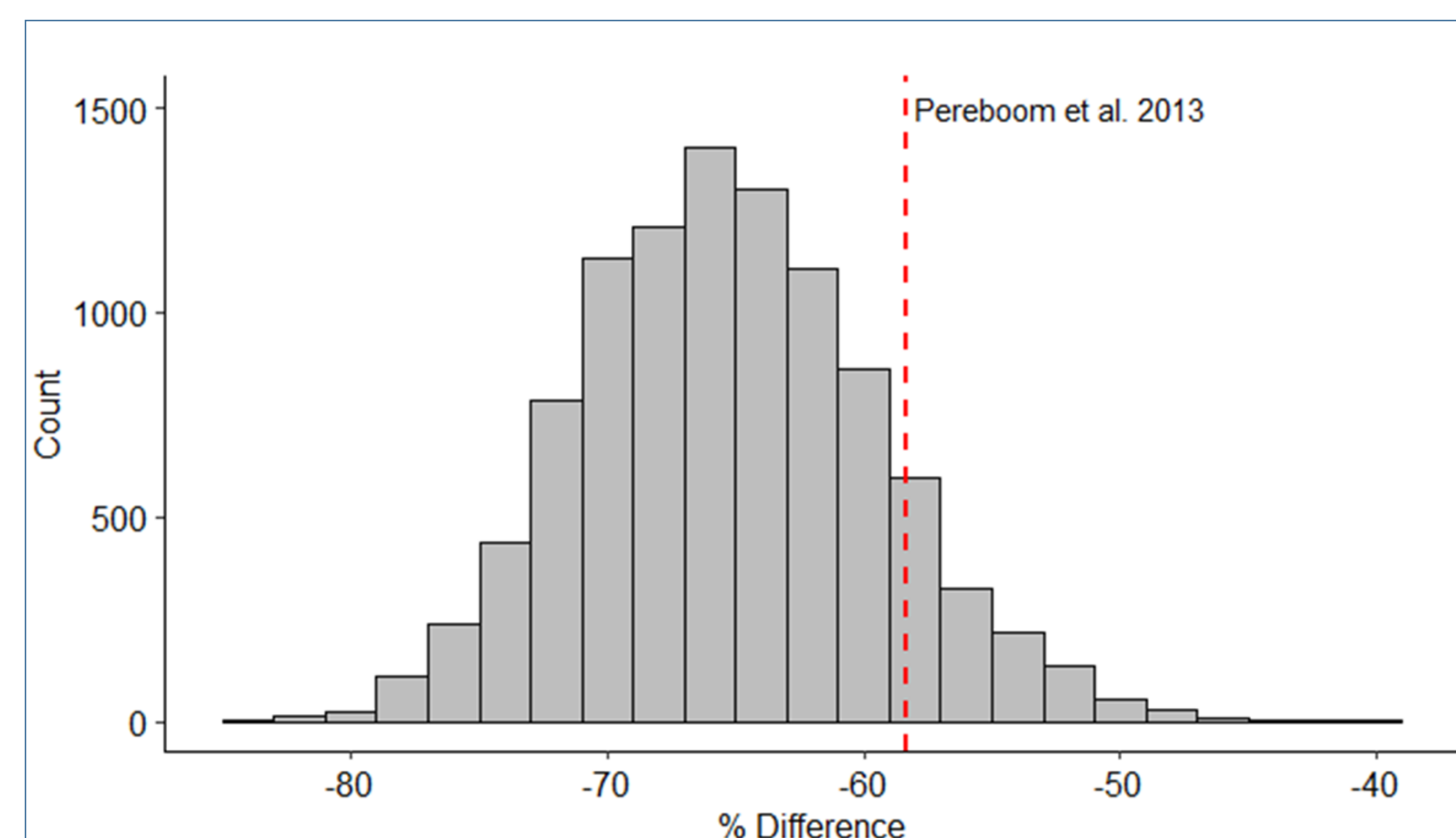


Fig 3. Simulated % difference between SRF and HRK based on Muldoon et al. 2017 survey data (10,000 replications of N = 230). The observed difference from Pereboom et al. 2013 falls within the range of potential outcomes from the Monte Carlo simulation.

Table 2. Estimated values of % high HRK of CMV in previous studies based on Monte Carlo simulation

Study	Population	SRF	Estimated HRK		
			Best Case	Most Likely	Worst Case
Doutre et al. 2016	US Total	0.09	0.05	0.03	0.01
	US w/ College	0.23	0.14	0.08	0.04
Cordier et al. 2012	FRA Hospital A	0.74	0.44	0.26	0.12
	FRA Hospital B	0.34	0.20	0.12	0.05
Jeon et al. 2006	US Healthcare	0.56	0.33	0.20	0.09
	US w/ College	0.31	0.18	0.11	0.05
Pereboom et al. 2013	NED Midwives	0.12	0.07	0.04	0.02
Thackeray et al. 2016	US Childcare	0.19	0.11	0.07	0.03

## HRK – How bad is it?

Based on the observed difference between SRF and HRK of CMV in Muldoon et al. 2017, we ran a Monte Carlo simulation to generate a distribution of potential outcomes for the difference (Fig 3). Using this distribution of potential outcomes, we could then estimate a range of possible % high HRK values in several populations from previous studies of CMV awareness (Table 2).

Based on these simulated values, we suggest that at best, only 5% of the general US population and 33% of US healthcare workers have high health-risk knowledge of CMV.

## Conclusions

While awareness might seem like a straightforward thing to measure, we believe that published estimates of CMV awareness probably overestimate true levels of actionable knowledge.

Observed and estimated differences between levels of self-reported familiarity and health-risk knowledge of CMV are significant and worrisome. It is important to address this knowledge difference through educational initiatives and public health messaging.

Going beyond familiarity to increase health-risk knowledge can help promote adoption of preventative behaviors, thereby reducing the impact of congenital CMV on families.

Awareness is necessary but not sufficient to prevent CMV infection. Women must not only be made aware of congenital CMV, they must also gain understanding of the behavioral adjustments needed to prevent the infection in order for public health interventions to be successful.

**Acknowledgements:** We thank Avery Williams. Funding was provided by Midwestern University to KMM.

## References

<sup>1</sup>Doutre et al 2016; <sup>2</sup>Cannon 2010; <sup>3</sup>Boppana et al 2013; <sup>4</sup>Adler & Nigro 2013; <sup>5</sup>Adler 2011; <sup>6</sup>Cordier et al 2012; <sup>7</sup>Jeon et al 2006; <sup>8</sup>Pereboom et al 2013; <sup>9</sup>Thackeray et al 2016; <sup>6</sup>Orne 1962; <sup>7</sup>Muldoon et al 2017;



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