# A SYSTEMATIC LITERATURE REVIEW AND POOLED RATES ANALYSIS OF HEART FAILURE TRIALS IN THE US

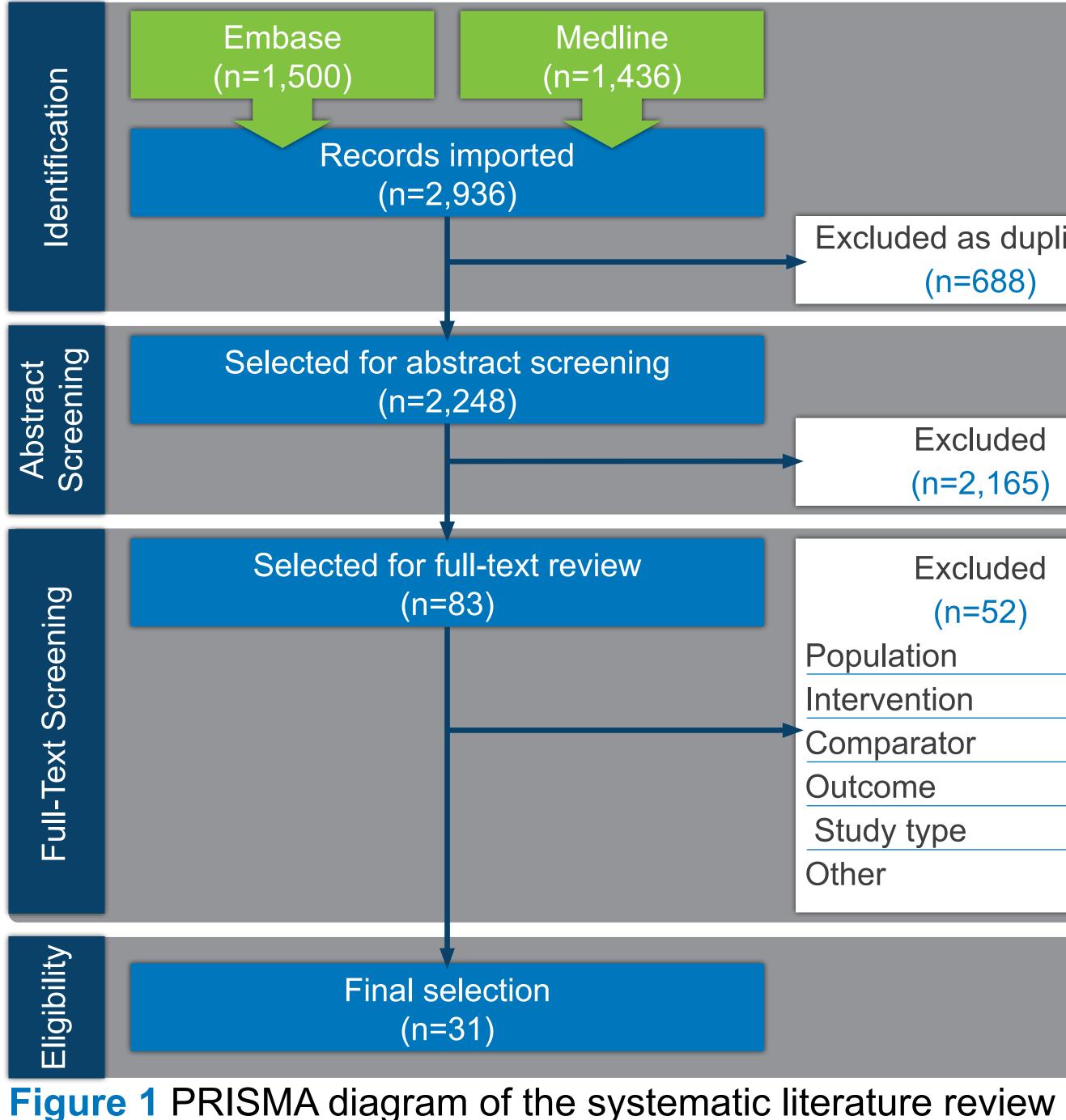
U. Silas,<sup>1</sup> J. Hafermann, <sup>1</sup> A. Bosworth Smith,<sup>1</sup> A. Veloz, <sup>2</sup> R. Saunders<sup>1</sup> (1) Coreva Scientific GmbH & Co KG, Koenigswinter, NRW, Germany; (2) ZOLL Medical, Pittsburgh, PA, USA

## **OBJECTIVE**

• To quantify the risk of outcomes experienced by patients receiving standard of care home monitoring in trials for nonpharmaceutical heart failure interventions.

## METHODS

- A systematic literature review (PROSPERO registration CRD42023410084) on heart failure in the US was conducted utilizing the EMBASE and PubMed databases to identify literature published between 2008 and 2023.
- The inclusion criteria were that the randomized controlled trial had to be completed in the US with patients who were over the age of 18 and who had been diagnosed with heart failure in the last 12 months.
- Studies needed to include a standard of care home monitoring arm
- Outcomes extracted were hospital readmissions, emergency room (ER) visits, survival, and length of hospital stay.
- A meta-analysis of proportion was performed using R software (Meta and Metafor packages)<sup>1</sup> following best practice guidance.<sup>2</sup>



Excluded as duplicates (n=688)

> Excluded (n=2,165)

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(n=52)	
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## RESULTS

- Across the two databases 2,936 abstracts were identified; once duplicates were removed, 2,248 remained for screening.
- After full-text review, 31 were included for analysis.
- The pooled estimate of all-cause and heart failure-specific hospital readmission at 3 months were:
  - 32.55% (95% CI: 24.03%; 41.63%, Figure 2A) • 33.19% (95% CI: 24.16%;42.83%, Figure 2B) 95% C.I.

Study	Events	Total	3-month (%)	9(
Dorsch 2021 Johnson 2022 Lee 2013 Schwarz 2008	12 4 9 13	41 14 21 40	28.57 42.86	[16.20; [7.41; [22.23; [18.73;
Common effect model Random effects model Heterogeneity: $I^2 = 0\%$ , $\tau^2 = 0$	), χ <sub>3</sub> <sup>2</sup> = 1.21	(p = 0.	32.55	[24.03; [24.03;
Study	Events	Total	3-month (%)	9(

Study	Events	Total	3-month (%)	9
Dorsch 2021 Lee 2013 Schwarz 2008	12 9 13	41 21 40	42.86	[16.20 [22.23 [18.73
Common effect model Random effects model Heterogeneity: $l^2 = 0\%$ , $\tau^2 = 0$	), χ <sup>2</sup> <sub>2</sub> = 1.13	(p = 0.	33.19	[24.16; [24.16;

## Figure 2

All-cause (A) and heart-failure-specific (B) readmissions for 3 months

- The pooled estimate of all-cause and heart failure-specific **ER visits** at 3 months were:
  - 21.91% (95% CI: 7.56%; 40.65%, Figure 3A) • 27.19% (95% CI: 7.06%; 53.52%, Figure 3B)

Study	Events	Total	3-month (%)	9
Bowles 2009	16	112		[ 8.35;
Lee 2013	3	21	14.29	[ 2.01;
Schwarz 2008	20	51	39.22	[26.18;
Common effect model			20.08	[14.43;
Random effects model			21.91	[ 7.56;
Heterogeneity: $I^2 = 83\%$ , $\tau^2 =$	0.0249, χ	2 <sup>2</sup> = 12.0	2 (p < 0.01)	
Study	Events	Total	3-month (%)	95
Lee 2013 Schwarz 2008	3 20	21 51		[ 2.01; [26.18;

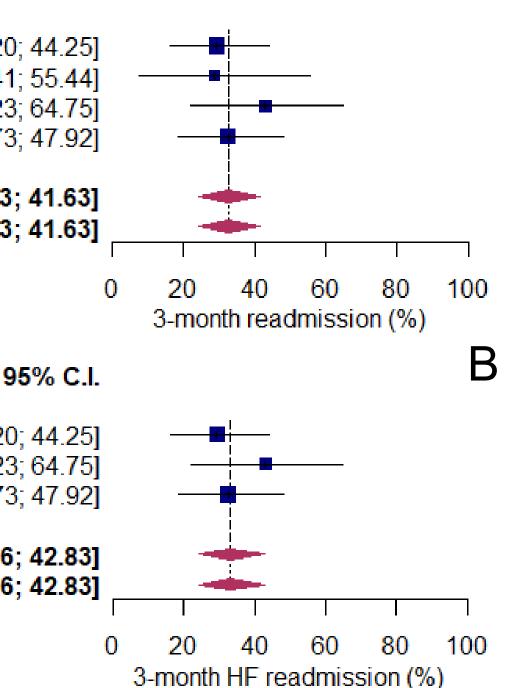
#### 31.23 [20.79; 42.66] Common effect model **Random effects model** 27.19 [7.06; 53.52] Heterogeneity: $I^2 = 77\%$ , $\tau^2 = 0.0281$ , $\chi_1^2 = 4.40$ (p = 0.04)

#### Figure 3

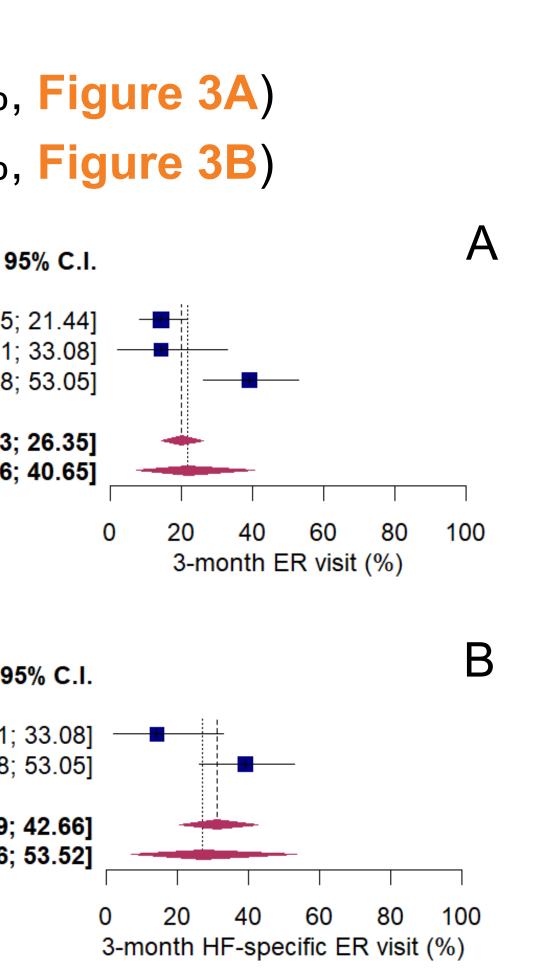
All-cause (A) and heart-failure-specific (B) ER visits for 3 months

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Α



## CONCLUSION

- (95% CI: 2.12%; 5.06%, Figure 4A).
- Figure 4B).

Study	Eve
Abraham 2011 Bekelman 2015 Chaudry 2010 Jayaram 2017 Kashem 2008 Lee 2013	
Lidenfeld 2021	

Ong 2016 Sharma 2011 Soran 2008 Wade 2011 Zile 2008

Common effect model Random effects model Heterogeneity:  $l^2 = 73\%$ ,  $\tau^2 = 0.0024$ ,  $\chi^2_{11} = 41.22$  (p < 0.01)

Study

Soran 2008 Zile 2008

Common effect model Random effects model Heterogeneity:  $I^2 = 0\%$ ,  $\tau^2 = 0$ ,  $\chi_1^2 = 0.67$  (p = 0.41)

### Figure 4

mortality for 6 months (B)

#### References

Vienna, Austria. URL https://www.R-project.org/

#### Disclosure

US, JH, and ABS are employees and RS is the owner of Coreva Scientific GmbH & Co KG, all of whom received consultancy fees for this research. AV is an employee of ZOLL Medical. The research was funded by ZOLL Medical.



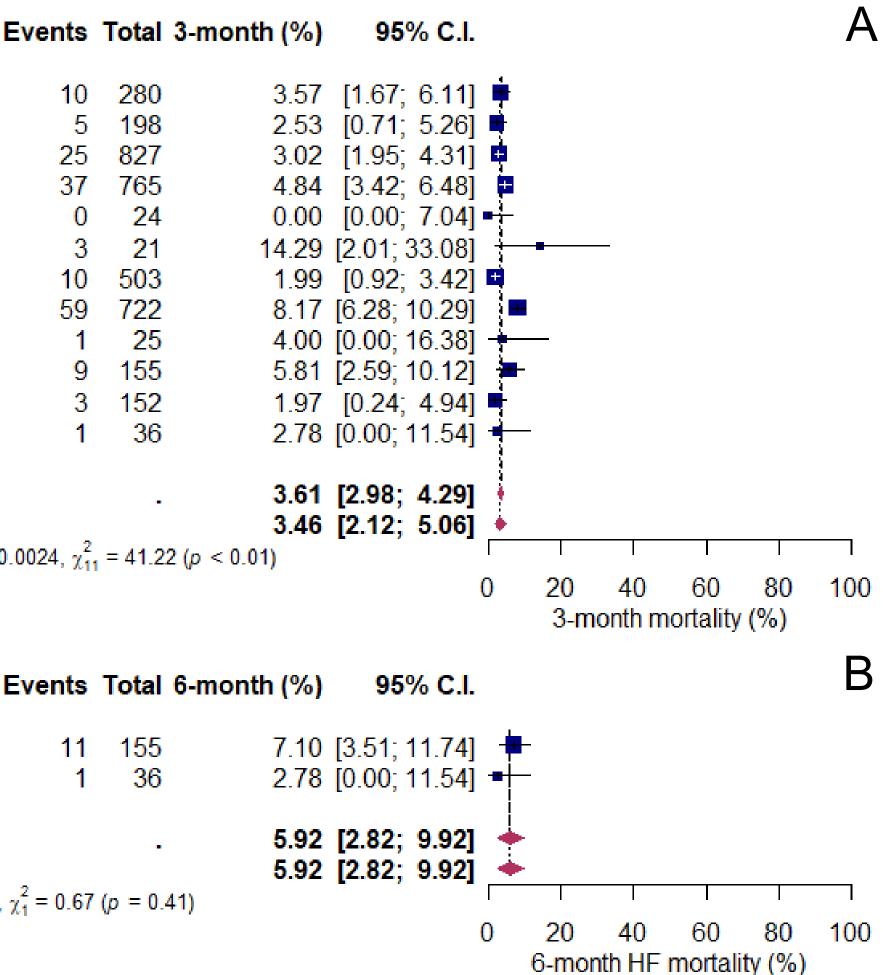
 Events that can increase the cost of care are relatively common in patients recently diagnosed with heart failure.

 Hospitalization and ER visit rates are similar between all-cause and heart failure-specific populations at 3-months.

 Interventions that could optimize care and prevent such events would likely be beneficial to both patients and payers.

• The 3-month all-cause **mortality** pooled rate was 3.46%

• Heart failure-specific mortality data were only sufficient for 6-months, the rate was 5.92% (95% CI: 2.82%; 9.92%,



# All-cause mortality for 3 months (A) and heart-failure-specific

1. R Core Team (2023). R: A language and environment for statistical computing. R Foundation for Statistical Computing, 2. Wang, N. (2023). Conducting Meta-analyses of Proportions in R. Journal of Behavioral Data Science, 3(2), 64-126