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Letter to the Editor

Trends in out-of-hospital cardiac arrest across the world: Additional data from the CanROC and RéAC national registries



To the Editor,

We read with interest the second report of the International Liaison Committee on Resuscitation (ILCOR) by Nishiyama et al.¹ This work reported data on systems of care and outcomes of out-of-hospital cardiac arrest (OHCA) drawn from a total of 15 national ($n = 11$) and regional ($n = 4$) population-based registries in North America, Europe, Asia and Oceania, which covered all emergency medical service (EMS)-treated OHCA in each area from 2015 through 2017.

Results showed that population coverage, data collection, registry structures, patient and EMS variables, and outcomes, were heterogeneous. Although the report noted most registries demonstrated an increase of bystander cardiopulmonary resuscitation (CPR), less than half showed favourable temporal trends in survival for all EMS-treated and bystander-witnessed shockable OHCA.

Inter-registries discrepancies in structure and data collection may explain in part this variability, which also probably results from complex and intricate factors related to population education, societal and cultural expectations, geographics and socio-economics, as well as EMS system organizations and practices. It is noteworthy that, in the ILCOR report, over 98% of EMS-assessed OHCA cases received EMS resuscitation attempts in Asia during the study period, while this rate was far less on other continents (40.1–66.9%).

Understanding the determinants of this variability is facilitated by international, collaborative OHCA registries such as the ones included in this ILCOR report (AUS-ROC, PAROS). Two national registries in Europe and North America (CanROC [Canada] and RéAC [France]), not included in this report, have formed an international collaboration. The CanROC registry contains OHCA data from 2005 onward.² Its current population base is 20 million people, it is expanding to include all provinces in Canada, and comprises a total of around 180,000 cases. RéAC was created in 2011, covers around 90% of France's 70-million population, includes a total of 150,000 OHCA cases, and takes part in pan-European EURECA studies.³ CanROC and RéAC have engaged in mutual efforts since 2020 to further explore hidden components of variability in OHCA outcomes through the creation of a research network and common registry, named ReACanROC.⁴

We used the ReACanROC's aligned, homogeneous dataset to describe temporal trends in both countries from 2015 to 2017.

Similarly to the results by Nishiyama et al., [Table 1](#) shows that bystander-attempted CPR rates increased in both countries, but no clear trend emerged regarding outcomes on a national level (2015 vs. 2017 survival rates: 11.2% vs. 10.0% in Canada, and 6.0% vs. 6.4% in France). Nevertheless, nation-wide results may raise further research questions, such as temporal trends of socio-geographic disparities or variation in accessibility to prehospital care. For example, the ReACanROC research network recently showed associations between low on-scene socioeconomic status, altered on-foot accessibility to public external defibrillators, and poorer outcomes of OHCA.⁵

Common, homogenized, international OHCA registries facilitate the conduction of large research projects aiming at identifying hidden predictors of multi-level variability. As others, CanROC, RéAC, and ReACanROC look forward to international collaborations aimed at increasing discovery to improve outcomes of OHCA.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Table 1 – Temporal trends of estimated incidence, bystander CPR in EMS-treated cases, survival, and favourable neurological outcomes in France and Canada (2015–2017).

	2015		2016		2017	
	Canada	France	Canada	France	Canada	France
Incidence, per 100,000 population ^o						
All cases	89.5	52.1	78.8	51.9	93.3	51.5
Adult, non-traumatic, EMS-treated	50.6	41.1	47.0	41.7	55.0	41.7
Bystander CPR, n (%) [*]	2,401 (45.0)	3,923 (46.0)	1,469 (53.1)	3,954 (48.6)	1,812 (53.1)	4,224 (51.2)
Outcomes [*]						
Survival, n (%)	598 (11.2)	515 (6.0)	333 (12.0)	540 (6.6)	341 (10.0)	528 (6.4)
Favourable neurological status, n (%)	NA	393 (76.3)	NA	417 (77.2)	NA	396 (75.0)
Outcomes ^a						
Survival, n (%)	262 (33.9)	226 (18.8)	163 (39.3)	266 (20.1)	165 (35.0)	279 (20.9)
Favourable neurological status, n (%)	NA	177 (78.3)	NA	208 (78.2)	NA	220 (72.2)

NA: not applicable.

^{*} In all cases recorded.

^o In France, EMS-assessed (Canada, 2015: n = 5,331; 2016: n = 2,768; 2017: n = 3,411; France, 2015: n = 8,533; 2016: n = 8,130; 2017: n = 8,251).

^a In non-traumatic, non-EMS witnessed, bystander-witnessed, shockable initial rhythms, EMS-treated cases: (Canada, 2015: n = 773; 2016: n = 415; 2017: n = 472; France, 2015: n = 1,204; 2016: n = 1,326; 2017: n = 1,337).

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