

Concordance Between Dementia Population Risk Tool DemPoRT and a Literature-Based Methodology Estimating 5-Year Dementia Risk

Sidney Nedelmann, BA, Julia Blumkaitis-Bosankic, MSc, Boaz Y. Saffer, PhD
Harrison Healthcare, Canada

Contact: jblumkaitisbosankic@harrisonhealthcare.ca



Background

DemPoRT estimates five-year dementia risk in adults aged ≥ 55 years. Literature-based models may be more adaptable to updated evidence, but agreement with established tools must be evaluated before interchangeable use.

Objectives

To assess whether a modular literature-based dementia risk model can:

- Reproduce DemPoRT five-year risk estimates under shared assumptions.
- Maintain agreement when contemporary epidemiological relative risks and prevalence estimates are used.
- Identify differences by age and sex.

Methods

- Synthetic cohort: 50,000 Canadian adults aged ≥ 55 years with DemPoRT-aligned distributions.
- Five-year dementia risk estimated using DemPoRT and a modular literature-based model under shared and contemporary-input scenarios.
- Included risk factors: age, sex, ethnicity, smoking status, pack-years, alcohol intake, fruit/vegetable intake, physical activity, and BMI.
- Agreement assessed using Pearson r , Spearman ρ , ICC, Bland-Altman analysis, and ANCOVA for age/sex effects.

Results

Overall strong agreement with DemPoRT:

- DemPoRT-input (Fig 1a): $r/p/ICC$ A 0.80/9.6/0.67. Agreement was strongest for rank ordering, indicating that individuals were generally classified from lower to higher risk in a similar order across models
- Contemporary (Fig 1b): A 0.66/0.73/0.54. With contemporary evidence inputs, the model still preserved meaningful risk ranking, but agreement in exact risk estimates was lower.

Figure 1a)

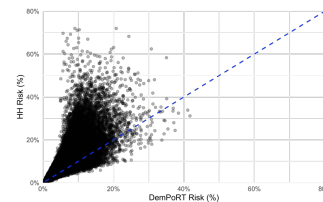
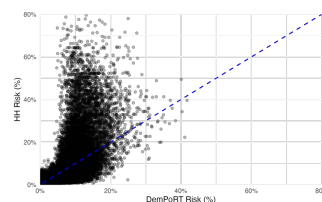


Figure 1b)



Bland-Altman patterns:

- Average differences were modest under shared assumptions, but the literature-based model tended to estimate slightly higher risk overall. Mean bias -1.8 pp; 95% LoA: -11.8 to $+8.1$ pp (Fig 2a).
- Although average bias remained small with contemporary inputs, wider limits of agreement indicated greater person-level variability between models. Mean bias -0.5 pp; 95% LoA: -14.1 to $+13.1$ pp (Fig 2b).

Figure 2a)

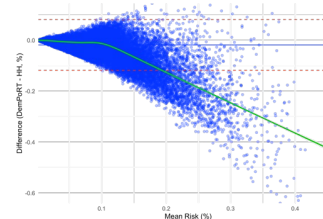
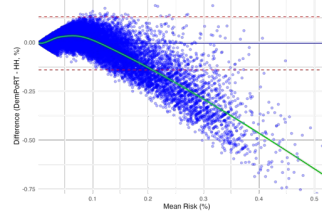


Figure 2b)



Age and Sex Differences:

Model differences increased with age and were largest in adults aged 80+. Women showed larger differences than men, particularly under shared DemPoRT assumptions. Negative values indicate that the literature-based model estimated higher risk than DemPoRT.

Subgroup	Shared DemPoRT assumptions	Contemporary evidence inputs
Ages 55–69	-0.3 pp; ± 1.8 pp	$+0.2$ pp; ± 3.0 pp
Ages 70–79	-2.4 pp; ± 8.6 pp	$+2.3$ pp; ± 7.6 pp
Ages 80+	-6.1 pp; ± 19.9 pp	-8.5 pp; ± 27.6 pp
Men	$+0.6$ pp; ± 2.4 pp	$+1.6$ pp; ± 6.4 pp
Women	-3.7 pp; ± 11.8 pp	-2.0 pp; ± 16.4 pp

Values are shown as bias; agreement range in percentage points. Bias = DemPoRT – literature-based model; negative values indicate higher estimates from the literature-based model.

Conclusions

- The literature-based model closely approximated DemPoRT under shared assumptions, especially at lower risk.
- Contemporary inputs preserved rank ordering but widened individual-level differences.
- Differences were greatest at higher risk, older ages, and among women.
- Prospective validation and calibration against clinical outcomes are recommended.

Disclosures: The authors report no conflicts of interest.