P032
THE RETURN OF SUBCLAVIAN CANNULATION IN THE CRITICAL CARE SETTING: A WESTERN CRITICAL CARE EXPERIENCE

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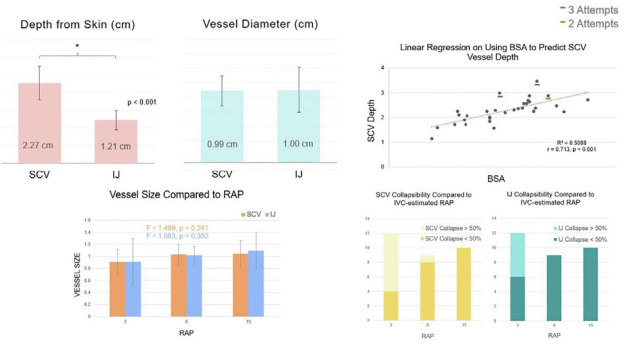
BACKGROUND: While subclavian vein (SCV) cannulation offers many advantages over alternative sites for central venous access, ultrasound (US)-guided cannulation of the internal jugular (IJ) vein has become the standard of care in most critical care settings. This is mostly attributable to the higher rates of mechanical complications from the traditional landmark (LM)-approach of SCV cannulation and the widespread availability of point-of-care ultrasonography (POCUS). However, there is limited literature exploring the feasibility of US-guided SCV cannulation in the critical care setting. This proof-of-concept study aims to determine the applicability of this technique in a critical care setting.

METHODS AND RESULTS: Informed consent was obtained from forty-one patients in a critical care setting to participate in the study and to undergo SCV cannulation. The procedure was performed with real-time US guidance. Attempts, success rate, and complications were recorded. These parameters are compared directly to the operator's IJ cannulation database that included 156 IJ cannulations. For the SCV group, ultrasound images of their SCV and IJ were taken along with a formal assessment of their IVC and analyzed to identify the determinants of a safer SCV cannulation. Finally, Coronary Care Unit (CCU) nurses were surveyed anonymously on their personal preference in central access positions. All forty SCV cannulations successful with on average 1.2 attempts. In contrast, IJ cannulation saw 6 failures to cannulate (4%) and on average 1.1 attempts. Three SCV cannulations (7.5%) resulted in mispositioning of the catheter tip compared to 4% in the IJ group. There were zero pneumothorax or hemothorax in both groups. The ultrasound data showed that SCV runs deeper than IJ by 1 cm on average. Both vessels are similar in size and their maximal diameter do not change significantly with volume status. Both vessels also remain relatively patent (collapse $<$ 50% on inspiration) with an estimated right atrial pressure (RAP) of 8 or 15. At a lower RAP, IJ tends to be more patent than SCV. Finally, 13 of 15 surveyed CCU nurses prefers SCV access for its convenience and patient comfort.

CONCLUSION: Overall, while US-guided SCV cannulation is slightly more complicated, both can be achieved in a timely manner with minimal number of attempts. The complication rates are similar, except for a higher likelihood of catheter malposition, which can be mitigated with modifications in technique. Finally, expertise garnered from this study is instrumental in informed decision making in instituting SCV cannulation in a critical care setting.

	SCV	IJ
Number Performed	40	156
Failed Cannulation	0	6
Average Attempts	**1.2** ±0.57	**1.1** ±0.41
Most # of Attempts	3	5
Malposition	3 (7.5%) 1 into IJ, 2 into innominate	6 (4%) All into SCV
Pneumothorax/ Hemothorax	**0**	**0**
Arterial Puncture	0	3



Canadian Cardiovascular Society (CCS) Abstracts — CAD General

P033
A COMPARISON OF SYNTHETIC DATA GENERATION AND FEDERATED ANALYSIS FOR PERFORMING AN INTERNATIONAL ASSESSMENT OF GENDER EFFECTS ON CARDIOVASCULAR HEALTH

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BACKGROUND: Cardiovascular diseases (CVD) are the leading cause of mortality and morbidity worldwide. Whether sex is associated with outcomes in patients with CVD differently across countries remains unknown. Assessing the interaction between sex and psycho-socio-cultural factors (gender) and country requires merging of country specific databases. Privacy concerns are barriers to data access and sharing. Therefore, we assessed the feasibility of pooling data from Canadian and Austrian populations to assess country-level differences in the role of sex, gender in cardiovascular health (CVH) using federated analysis and data synthesis.

METHODS AND RESULTS: The datasets used were from the Canadian Community Health Survey (CCHS), and the Austrian Health Interview Survey (ATHIS) in 2014. Only CCHS dataset was synthesized using sequential classification and regression trees. The privacy of the CCHS synthetic data was assessed using a membership disclosure test and F1 score. The low value means that the dataset can be deemed

as having low privacy risks. Once it was deemed to be non-personal information, the synthetic dataset was sent to the Austrian team for pooling and analysis. The analysis was performed on the pooled source ATHIS data and the synthetic CCHS data. The outcome variable was CVH, calculated through a modified CANHEART index in both countries. The utility of the pooled dataset was evaluated by comparing the regression model with the model constructed from federated analysis using DataSHIELD. A significant time elapsed to set-up the necessary servers in multiple locations with the requisite security protocols for the federated analysis. For assessing Privacy Risks of Synthetic Data, the largest membership disclosure F1 score across different attack datasets was 0.001, indicating low privacy risk. A comparison of the marginal distributions between males and females showed consistent results in the federated and pooled analyses of synthetic data. In the multivariate analysis of the main effects, the parameter estimates of the federated and pooled analysis were directionally the same as for the univariate analysis. In the multivariate analyses considering the country interactions to determine whether country moderates the relationship between the other variables and CVH, the impact of several factors differed between countries (Table 1).

CONCLUSION: The result of this secondary analysis of population-based datasets revealed that synthetic data generation methods can be safely and reproducibly used to pool datasets across countries for international studies. There were significant country-level differences in the role of sex, and gender in CVH which demonstrates the importance of pooling datasets from different jurisdictions.

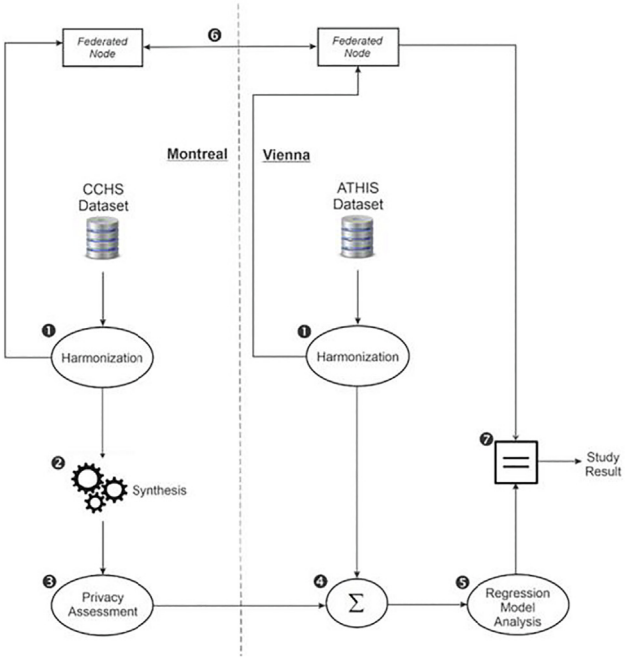

Table 1: Multivariate Main Effects Models for Predicting CVH in Federated and Pooled Analyses

CANHEART score**	Federated Analysis	Pooled Analysis	Federated Analysis with Country Interaction		Pooled Analysis with Country Interaction	
	Main Effect Regression Coefficient (95% CI)***	Main Effect Regression Coefficient (95% CI)	Main Effect Regression Coefficient (95% CI)	Country Interaction Coefficient (95% CI)	Main Effect Regression Coefficient (95% CI)	Country Interaction Coefficient (95% CI)
Sex (*ref:* male)	0.25 (0.23, 0.26)*	0.23 (0.21, 0.25)*	0.226 (0.211, 0.24)*	0.157 (0.122, 0.191)*	0.2 (0.186, 0.216)*	0.18 (0.147, 0.216)*
Education	0.04 (0.04, 0.05)*	0.05 (0.04, 0.06)*	0.036 (0.03, 0.042)*	0.08 (0.063, 0.101)*	0.041 (0.039, 0.051)*	0.073 (0.054, 0.093)*
Marital status (*ref:* Single)						
Divorced/widowed	-0.12 (-0.14, -0.09)*	-0.13 (-0.16, -0.11)*	-0.112 (-0.138, -0.087)*	-0.039 (-0.103, 0.02)	-0.125 (-0.152, -0.099)*	-0.026 (-0.091, 0.038)
Married	-0.15 (-0.17, -0.13)*	-0.14 (-0.16, -0.12)*	-0.169 (-0.19, -0.147)*	0.057 (0.008, 0.107)*	-0.144 (-0.162, -0.119)*	0.029 (-0.02, 0.079)
Household Size	0.05 (0.04, 0.06)*	0.07 (0.05, 0.08)*	0.051 (0.042, 0.059)*	-0.011 (-0.02, 0.007)	0.07 (0.063, 0.08)*	-0.032 (-0.051, -0.013)*
House Income (*reverse coded*)	-0.08 (-0.09, -0.07)*	-0.03 (-0.04, -0.02)*	-0.13 (-0.145, -0.12)*	0.12 (0.1, 0.147)*	-0.026 (-0.042, -0.017)*	0.021 (-0.0008, 0.044)
Immigrant (*ref: No*)	0.13 (0.12, 0.15)*	0.11 (0.09, 0.13)*	0.163 (0.143, 0.183)*	-0.297 (-0.365, -0.15)*	0.12 (0.101, 0.142)*	-0.165 (-0.224, -0.107)*
Age	-0.13 (-0.14, -0.13)*	-0.14 (-0.14, -0.13)*	-0.126 (-0.132, -0.12)*	-0.06 (-0.077, -0.048)*	-0.127 (-0.133, -0.122)*	-0.06 (-0.075, -0.046)*
Country (*ref:*CA)	-0.01 (-0.03, 0.002)	-0.03 (-0.05, -0.02)*	-0.222 (-0.335, -0.117)*	-	-0.177 (-0.295, -0.051)*	-
R^2	0. 63	0.153	0.168		0.157	

Pooled Analysis: Synthetic CCHS + Real ATHIS
Federated Analysis: Real CCHS + Real ATHIS
* p<0.05
**CANHEART index: A measure of CVH in the population, consisting of 4 cardiometabolic risk factors (i.g, smoking, obesity, diabetes and hypertension), 0 (worst) to 4 (ideal)
*** Regression Coefficient: The degree of change in the CANHEART index for every 1-unit of change in the predictor variables
**** Country Interaction Coefficient: **The coefficient of interaction of each variable with country (i.e, Education*Country)**
Number of participants in CCHS: **63,522; 55.3% females**
Number of participants in ATHIS: **15,771, 55.7% females**

P034
EFFECT OF TAFAMIDIS ON GLOBAL LONGITUDINAL STRAIN USING A CORRECTION METHOD IN TRANSTHYRETIN CARDIAC AMYLOIDOSIS

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BACKGROUND: Various pharmacological options have been developed for TTR cardiac amyloidosis (TTR-CA), targeting different phases of the disease process. Tafamidis is a stabilizer of the TTR molecule that reduces CV mortality and CV-related hospitalization in patients with either wild-type or hereditary TTR CM. Echocardiography is an important tool in the diagnosis and follow-up of patients with TTR-CA, however, no echocardiographic markers of response to treatment with Tafamidis have been identified to date. Global Longitudinal Strain (GLS) is a measure that has clinical value in the diagnosis of TTR-CA. As atrial fibrillation is common in patients with TTR-CM, the GLS with the square root of the RR-interval (GLS/$\sqrt{}$(RR)) may offer an alternate method to assess GLS is this population. In this study, we aimed to evaluate the role of GLS/$\sqrt{}$(RR) to assess treatment response with Tafamidis.

METHODS AND RESULTS: We conducted a single-center, retrospective case-control study of 48 patients with TTR-CM matched for age and sex. Twenty-four patients were treated with Tafamidis and 24 did not receive treatment. Patients underwent a baseline echocardiogram and at one-year post-initiation of Tafamidis. Clinical and laboratory characteristics are shown in Table 1. Two-dimensional speckle tracking echocardiography was analyzed offline using a vendor-neutral software (Epsilon Imaging). GLS was calculated as the average of strain from 3 long-axis views and then indexed to the square-root of the RR interval (GLS/$\sqrt{}$(RR)). 14 patients had atrial fibrillation. Over 12 months, GLS/$\sqrt{}$(RR) deteriorated less in the Tafamidis group by a median of 3.4% (IQR -3.8 − 10.4) compared with 13.3% (IQR 5.6 − 18.7) in the untreated group (p=0.002). Similarly, non-indexed GLS deteriorated less in the Tafamidis group by a median of 3.2% (IQR -3.5 − 8.4) compared with 11.6% (IQR 7.6 − 21.5) in the untreated group ($P < 0.001$). There was also a significant difference in the reduction in LVEF 3.2% (IQR -2 − 7) in the Tafamidis group versus 9.5% (IQR 6 − 20.3) in the untreated group ($P < 0.001$).