Making Australia the benchmark in Echocardiography databases: The National Echo Database Australia (NEDA)

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Background: Epidemiological research from population-based cohort studies have shaped public health strategies. Echocardiography (echo) is one of the most commonly performed cardiac investigations in Australia, however there is limited epidemiological data quantifying cardiovascular risk for various echo measurements. From Medicare Australia data, 919,309 echo's were processed in 2015, excluding State Government hospital echo data.

Aims: To develop the National Echocardiography Database Australia (NEDA), capturing measurement data from digital echo labs across Australia, and to link this data with national death index (NDI). We seek to obtain mortality risk statistics for each cardiac abnormality studied.

Methodology: We have developed an architectural prototype and a "scraper" tool to retrieve every variable from each echo lab, including retrospective data. We identified 650 unique measurements obtained from a comprehensive echo exam. We wrote a unique data dictionary to account for differing variable names from different labs. Text was converted into variables using a parsing algorithm.

Results: Two complete echo databases from different software vendors, have been scraped and combined totalling 307,656 echocardiograms collected between 2001 and 2015. Conversion of variable names and measurement units was performed to unify data formats. A total of 5,477,019 valid data points were collected, mean age 62.9+/-16.95.

Conclusions: Using novel database engineering we combined two echo databases from different echo software manufacturers into one database containing over 300,000 individual echocardiograms. Phased roll-out of NEDA to multiple sites is now planned along with linkage to the NDI, allowing large scale epidemiological research.