

Economic Burden of Adverse Drug Reactions and Potential for Pharmacogenomic Testing in Singaporean Adults

INTRODUCTION

- Adverse drug reactions (ADRs) contribute to increased hospital admissions¹
- ADR survey in 1000 random adults admitted non-electively to SGH²
 - 12.4% of patients had at least 1 ADR at admission
 - 8.1% of admissions were caused by an ADR
- Pre-emptive pharmacogenetic (PGx) testing can potentially reduce ADRs and its associated costs

OBJECTIVES

- To quantify the economic burden of ADRs
- To estimate the breakeven cost of pre-emptive PGx testing in Singapore

METHODS

- Itemized cost for 1000 random non-elective adult hospitalizations in SGH
- Economic burden
 - Total cost of hospitalizations caused by ADRs
 - Incremental costs
 - Cost of admissions with ADRs vs. that of propensity score-matched controls
 - Wilcoxon sign rank test
- Pre-emptive PGx testing breakeven cost
 - Avoidable hospitalization costs due to drugs with a PGx association*
 - Estimated number of people taking those drugs*
 - Amounts extrapolated to entire Singapore population over a year

RESULTS and CONCLUSIONS

Total Cost

- 81 admissions caused by ADRs → **S\$788, 298**
- Bleeding and/or elevated International Normalized Ratio (INR) cost more than other types of ADRs (Table 1)

Table 1 Total cost of admissions cause by top 5 ADR types

ADR type	N	Median (range), S\$		P
		Yes	No	
Gastrointestinal	18	\$2760 (\$981 - \$112600)	\$4179 (\$817 - \$55710)	0.385
Bleeding/elevated INR	15	\$13690 (\$1953 - \$26710)	\$3111 (\$817 - \$112600)	6.58 x 10⁻³
Electrolyte abnormalities	8	\$2289 (\$1082 - \$8331)	\$4179 (\$817 - \$112600)	0.157
Infection/sepsis	6	\$6563 (\$2256 - \$55710)	\$3902 (\$817 - \$112600)	0.422
Hypotension	6	\$2960 (\$1082 - \$6054)	\$4228 (\$817 - \$112600)	0.245

Incremental Cost

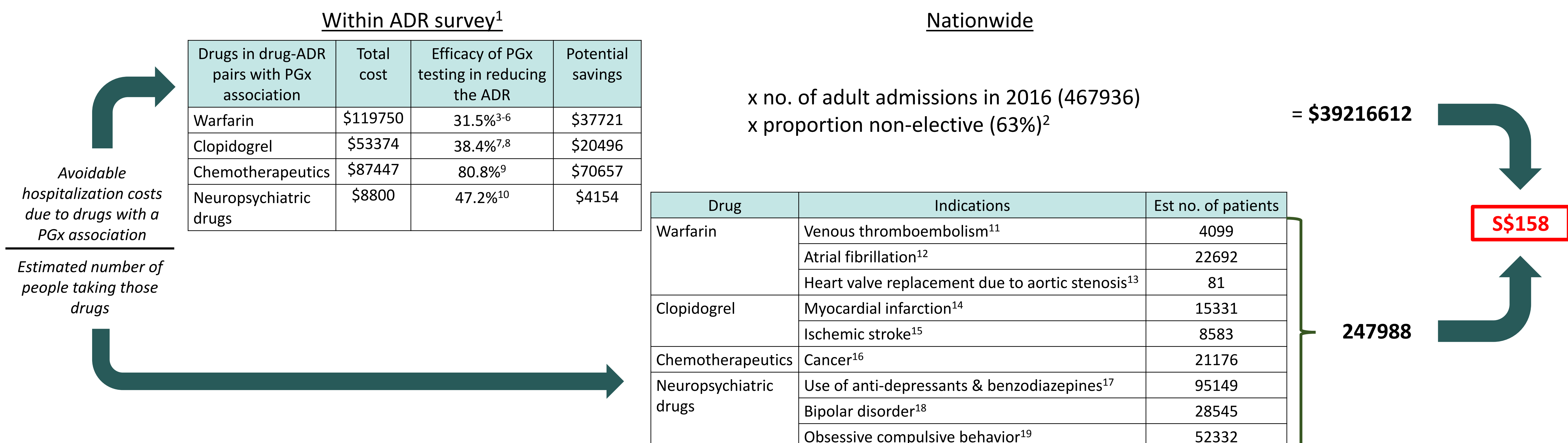
- Total incremental cost was not significantly higher
- Costs for laboratory investigations were significantly higher in admissions with ADRs (Table 2)

Table 2 Incremental costs of ADRs

Cost type	Admissions caused by ADRs		Admissions with but not caused by ADRs	
	Median of differences (95%CI), S\$	p	Median of differences (95%CI), S\$	p
Total	\$477 (-\$685 - \$3455)	0.243	-\$12 (-\$2077 - \$5893)	0.561
Drugs	\$66 (-\$23 - \$203)	0.100	-\$11 (-\$142 - \$164)	0.941
Laboratory investigations	\$259 (\$124 - \$901)	0.005	\$391 (\$137 - \$1410)	0.014
Other investigations	\$28 (-\$199 - \$521)	0.412	\$293 (-\$77 - \$896)	0.118
Treatments and procedures	\$36 (-\$135 - \$484)	0.329	\$86 (-\$205 - \$732)	0.265
Ward	\$106 (-\$65 - \$1159)	0.104	\$79 (-\$533 - \$1784)	0.455
Service and facility fees	\$0 (-\$189 - \$282)	0.903	\$0 (-\$422 - \$1241)	0.874
Consumables and misc	-\$7 (-\$100 - \$133)	0.912	\$10 (-\$164 - \$737)	0.747

The numbers each of cases and controls for admissions caused by ADRs and admissions with but not caused by ADRs were 76 and 37, respectively.

Pre-emptive PGx breakeven cost



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