

Can Automated Case-Finding fully replace Manual Sources at UroCaRe (Urological Cancer Registry) at Singapore General Hospital?

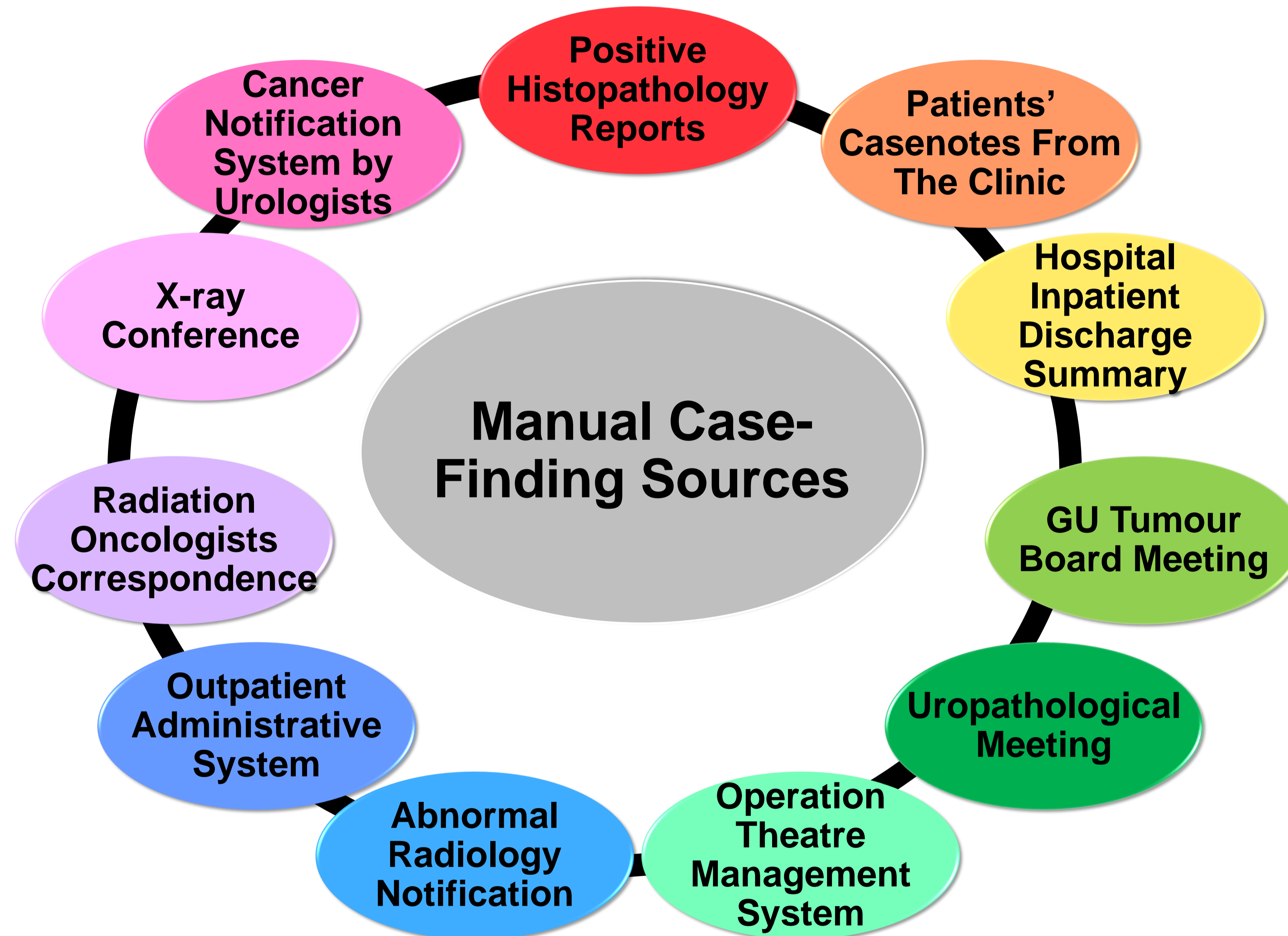
Saajida Begum Binte Syed Aneesur Rahman, Huang Hong Hong, Ng Mei Ying, Lim Kheng Sit Jay, Weber Lau Kam On
Department of Urology, Singapore General Hospital

INTRODUCTION

- ❖ 11 manual casefinding sources were used to search for potential eligible* new cancer cases at UroCaRe at Singapore General Hospital
- ❖ An automation process has been established recently for casefinding.

*The eligible cases were urological cancers that met the criteria of the US Commission on Cancer (CoC) standard and were diagnosed and/or treated at Singapore General Hospital (SGH).

Figure 1: Manual Sources of Casefinding



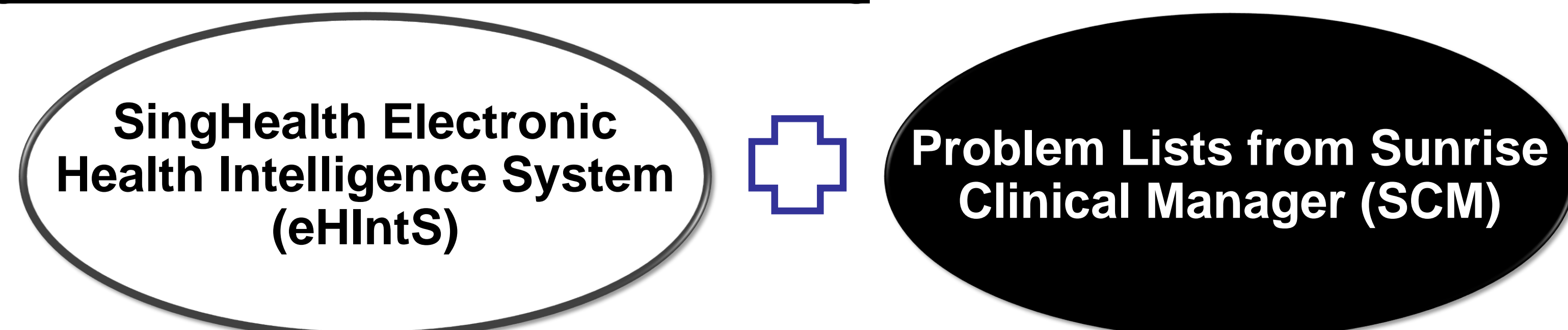
OBJECTIVE

- ❖ To determine whether the automated system can fully replace the existing 11 manual sources based on casefinding completeness and efficiency.

MATERIALS AND METHODS

- ❖ Potential eligible new cancer cases from the manual sources were compared with the cases from 2 automated sources for the time period of January to June 2018:

Figure 2: Automated Sources of Casefinding



- ❖ eHIntS retrieved cases using Oracle Business Intelligence Enterprise Edition (OBIEE) based on
 - ❖ Surgical procedure codes
 - ❖ Lab marker mnemonic codes
 - ❖ SNOMED international T Codes
 - ❖ Drug names
 - ❖ ICD-10 AM codes
- ❖ Problem List retrieved all inpatient and outpatient cases admitted and/or discharged from the hospital with SNOMED SCT diagnosis codes.
- ❖ All data were processed in R version 3.3.1.

RESULTS

Table 1: Cases from Manual Casefinding in Automated Casefinding Lists

	Manual	Automation		
		eHIntS Only	eHIntS & Problem Lists	Problem Lists Only
Total Number of Potential Eligible Cases	521	122	366	33
		521		

- ❖ All 521 potential eligible new January-June 2018 cancer cases from the manual sources were found in the 2 automated sources.

Table 2: Completeness of Casefinding

Case-Finding			
Number of Potential Eligible Cases in Manual Only	Number of Potential Eligible Cases Common in eHIntS & Manual	Number of Potential Eligible Cases in Problem Lists only	Number of Potential Eligible Cases in eHIntS & Problem Lists
0	521	19	540
(540-521)/521 *100 = 3.6% more cases			

- ❖ Full automation provides 3.6% more cases than the manual system.

Table 3: Total hours spent in Automated Casefinding for 6 months in comparison to Manual Casefinding

Casefinding	Time spent (hours) for 6 months	
	Manual	Full automation
Automation	Nil	
	Retrieval of eHIntS data	4.25
	Receiving Problem Lists from Sunrise Clinical Manager	0
	Processing eHIntS & Problem Lists using scripts	4.25
	eHIntS List Data Verification	27.25
Problem List Data Verification	27.25	
Manual (11 Sources)	253.5	Nil
Total	253.5	63

- ❖ During the development phase, 85 hours was spent in writing the R script and 17 hours processing eHIntS & Problem Lists using scripts.
- ❖ The efficiency is increased by $(253.5 - 63)/253.5 = 75.1\%$ upon full automation of case-finding.

CONCLUSION

- ❖ Automated casefinding can fully replace manual casefinding as it is superior in both completeness and efficiency and therefore has been implemented by UroCaRe.
- ❖ Currently, we are making efforts to increase eventual efficacy more than 75% through implementation of Natural Language Processing (NLP).

ACKNOWLEDGEMENTS

- ❖ Department of Urology, Singapore General Hospital
- ❖ Urology Teaching Fund – 22520093
- ❖ Health-PASS 2016 & Health Services Research and Analytical Technologies for SingHealth (HEARTS) 2017
- ❖ Integrated Health Information Systems Pte Ltd
- ❖ SingHealth Endowment Fund & NMRC/TA/0005/2012