Service Priorities and Programmes

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Introducing a new interview scheduling method to speed up the consultation process of Clinical Services Plan based on mathematical modeling

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Introduction

As part of the Hong Kong West Cluster Clinical Services Plan (CSP), consultation interviews were required to be scheduled in a 4-week period for stakeholders to present their views and comments. The scheduling process was a challenge: • 348 colleagues in 32 specialties/departments were to be interviewed (i.e. on average more than 17 colleagues per day). • 3 rounds of interviews were needed for each specialty/department. Each interview session involved several colleagues (up to 20), while some colleagues needed to attend multiple sessions. • A sequencing rule was required to be observed for the 3 rounds of interviews. • Lunch breaks and specific black-out dates/timeslots were required.

Objectives

To minimize scheduling conflicts and maximize interview attendance.

Methodology

(1) Target interviewees from each specialty/department service were identified. (2) An Excel-based scheduling tool was sent to all target interviewees for them to indicate their availability in the 4-week period. Colleagues who did not advise their availability were assumed to be flexible in the entire consultation period. (3) A mathematical optimization model, namely a Mixed Integer Program, was then developed for the scheduling process. Such mathematical optimization models have been widely employed in various industries for selecting the best one from a set of alternatives. In this case, the optimization model was formulated to provide a schedule that fitted the availability of the highest number of colleagues, while satisfying all the scheduling constraints mentioned above.

Result

(1) A master interview schedule with 107 interview sessions for 348 distinct colleagues (total attendance of 457) was developed. The resulting schedule satisfied

all constraints and was mathematically-proven optimal. (2) Of the 50% of target interviewees who advised their availability, 90% of them had their interview sessions scheduled at a time which they have indicated to be available. (3) The small number of scheduling conflicts was mitigated by inviting the interviewees to send in representatives, or by scheduling additional sessions. (4) No additional cost was involved. A cost-free mathematical optimization model was adopted in CSP for a complex consultation exercise to maximize the number of colleagues interviewed within a short period of time, which could not have been made possible by traditional manual scheduling. Not only did this new scheduling method drastically reduce the time spent on the complex scheduling process, but more importantly it minimized the divergence that would potentially arise if the scheduling was conducted manually and involving subjective human factors.