INAUGURAL SINGAPORE ALLIED HEALTH CONFERENCE
Allied Health Professionals : Our Role in the Future of Healthcare

Time-motion analysis for productivity

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Background

To understand the impact of the following on productivity:

1. Validity of referrals
   - Proportion of inappropriate referrals

2. Actual clinical time utilisation
   - Both face to face (F2F) activities and non- face to face (non- F2F) activities

Approach

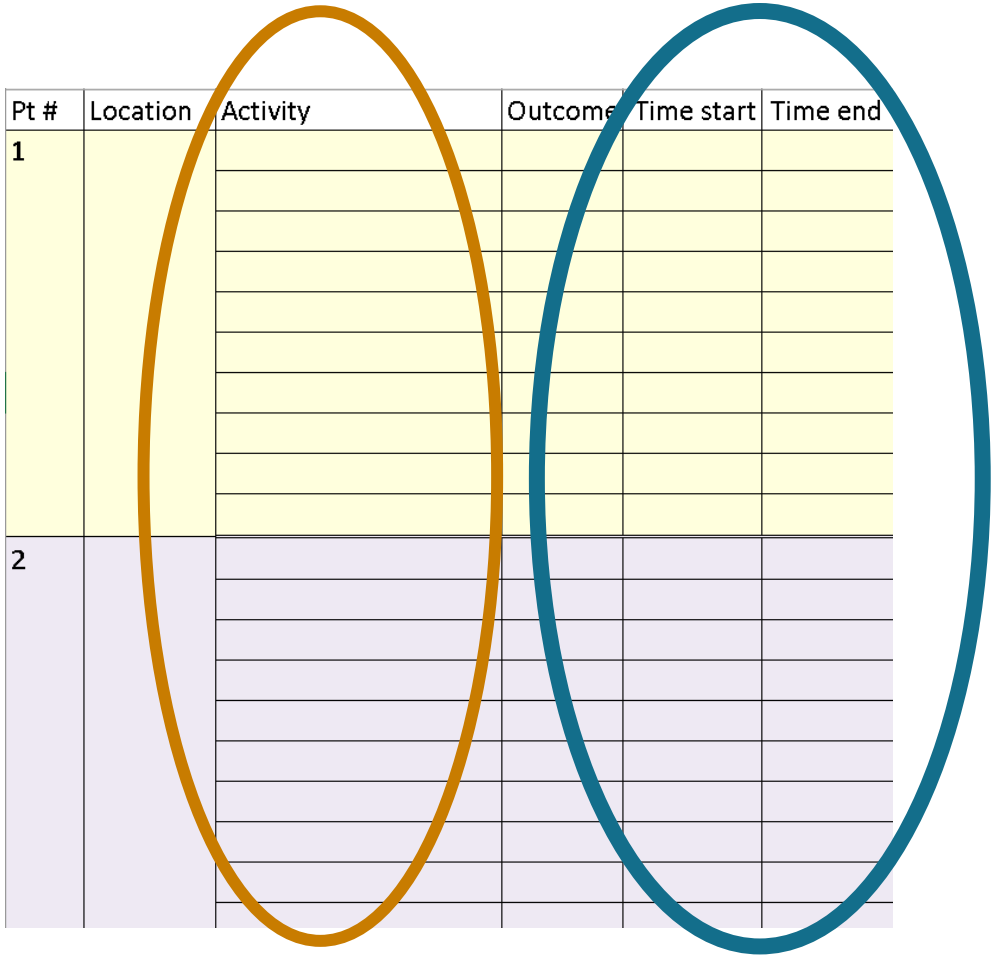
Time motion study

Duration to complete specific activities

Series of activities involved for a work process to be completed

Approach

- Activities involved in work process (motion)
- Timestamps (time)



Approach

Additional data

- Location
- Number of Patient

Pt #	Location	Activity	Outcome	Time start	Time end
1					
2					

Approach (demo)

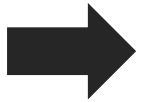
Pt #	Location	Activity	Outcome	Time start	Time end
1					
2					

Inpt
Outpt
AnE

Approach (demo)

Pt #	Location	Activity	Outcome	Time start	Time end
1	**Inpt**				
2					

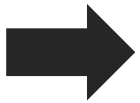
- Case validation
- Pre-consult
- Preparing
- Face to face consult
- Post-consult
- Speaking to Staff
- Speaking to family/patient
- External Reports



Pt #	Location	Activity	Outcome	Time start	Time end
1	**Inpt**	Pre-consult		14:24:13	
2					

Approach (demo)

Pt #	Location	Activity	Outcome	Time start	Time end
1	**Inpt**	Pre-consult		14:24:13	
			Done		
2					



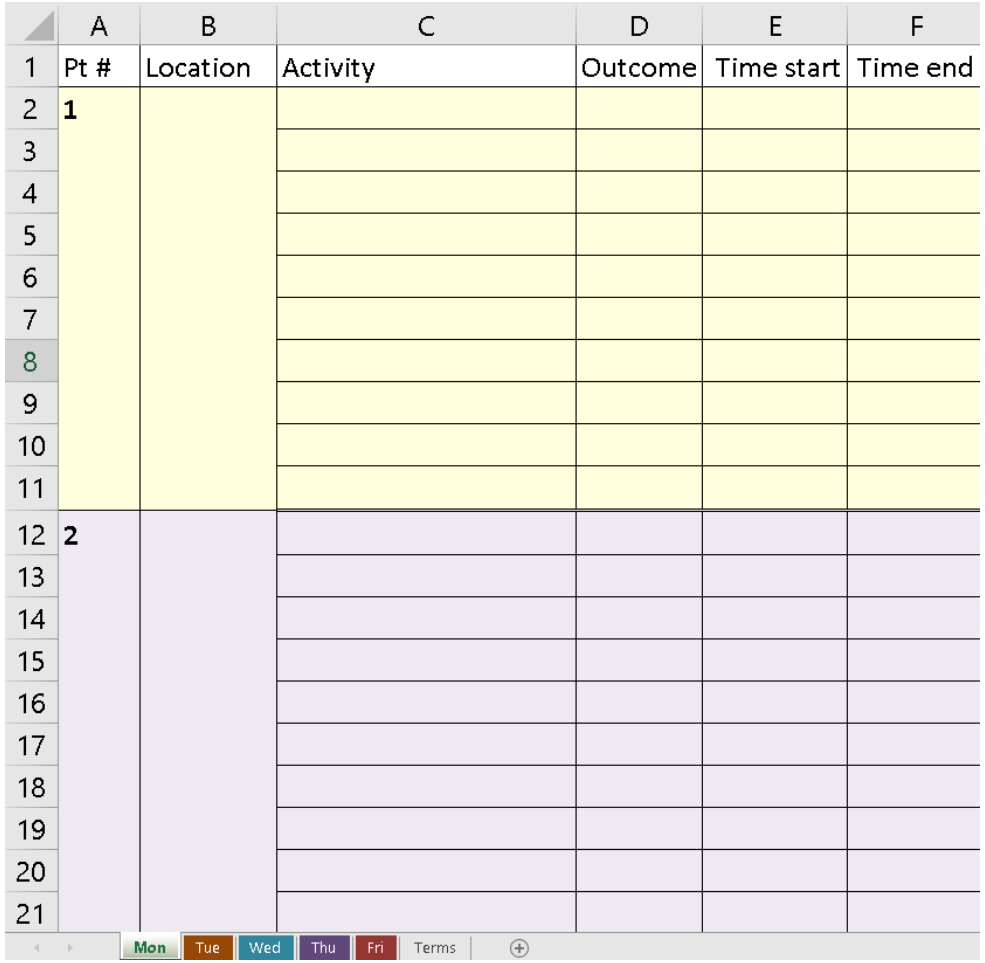
Pt #	Location	Activity	Outcome	Time start	Time end
1	**Inpt**	Pre-consult	Done	14:24:13	14:27:21
2					

Approach (data collection)

How: Excel template on mobile phones

Who: 11 therapists from 2 teams

When: 15 weeks



	A	B	C	D	E	F
1	Pt #	Location	Activity	Outcome	Time start	Time end
2	1					
3						
4						
5						
6						
7						
8						
9						
10						
11						
12	2					
13						
14						
15						
16						
17						
18						
19						
20						
21						

Mon | Tue | Wed | Thu | Fri | Terms

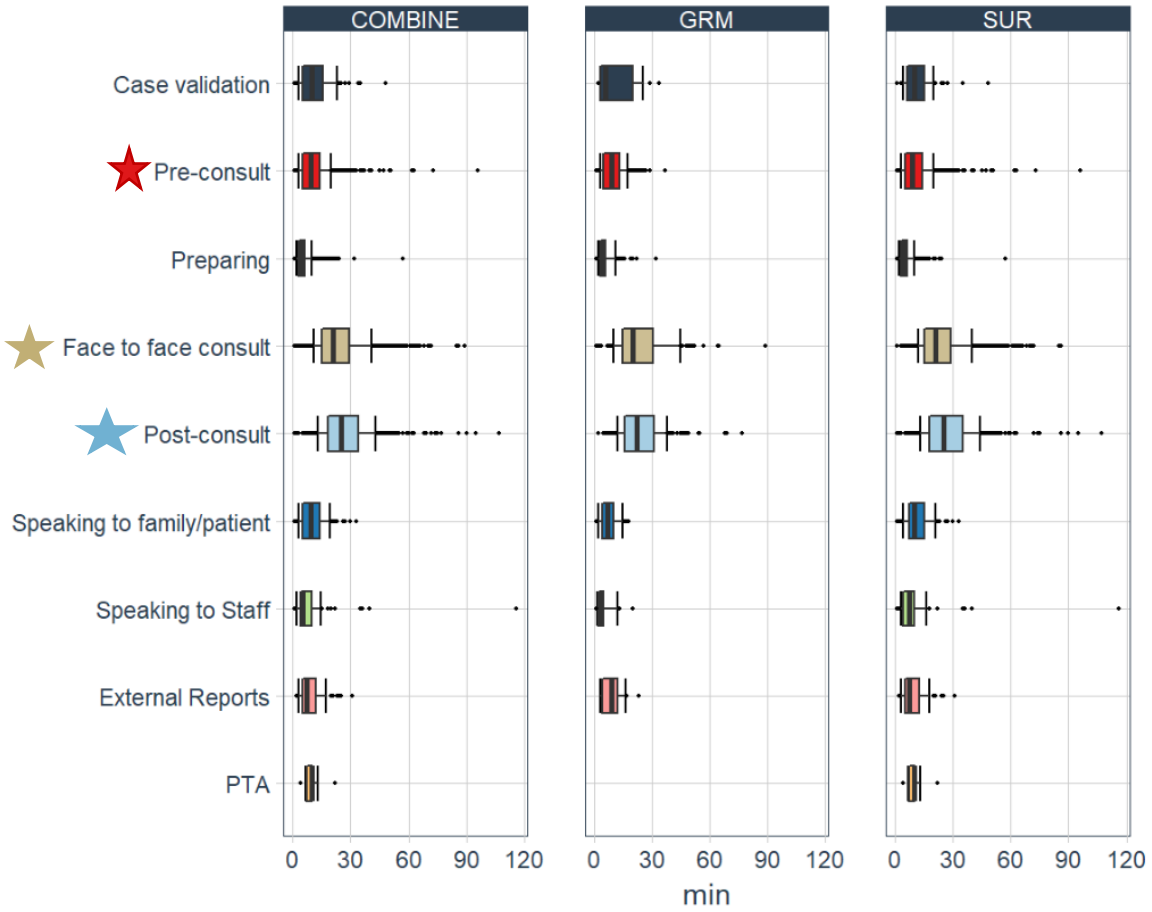
Approach (analysis & reporting)

- Analysis and visuals adapted from a business process analysis (Janssenswillen, 2019)
- Done with code (R language)
- Built a hybrid dashboard-report

Outcomes (validity referrals)

- Proportion of invalid cases were small (5.8%)
- Median duration to validate inappropriate referrals was 10mins

Outcomes (activity breakdown)



Median time for a case:

- 1/3 of time F2F activity
- 1/3 of time non-F2F activities (documentation: pre-consult and post consult)
- 1/3 of time spent with remaining non-F2F activities

Lessons Learnt (productivity)

Case validation

- Small proportion and limited time spent
- Minor impact on productivity

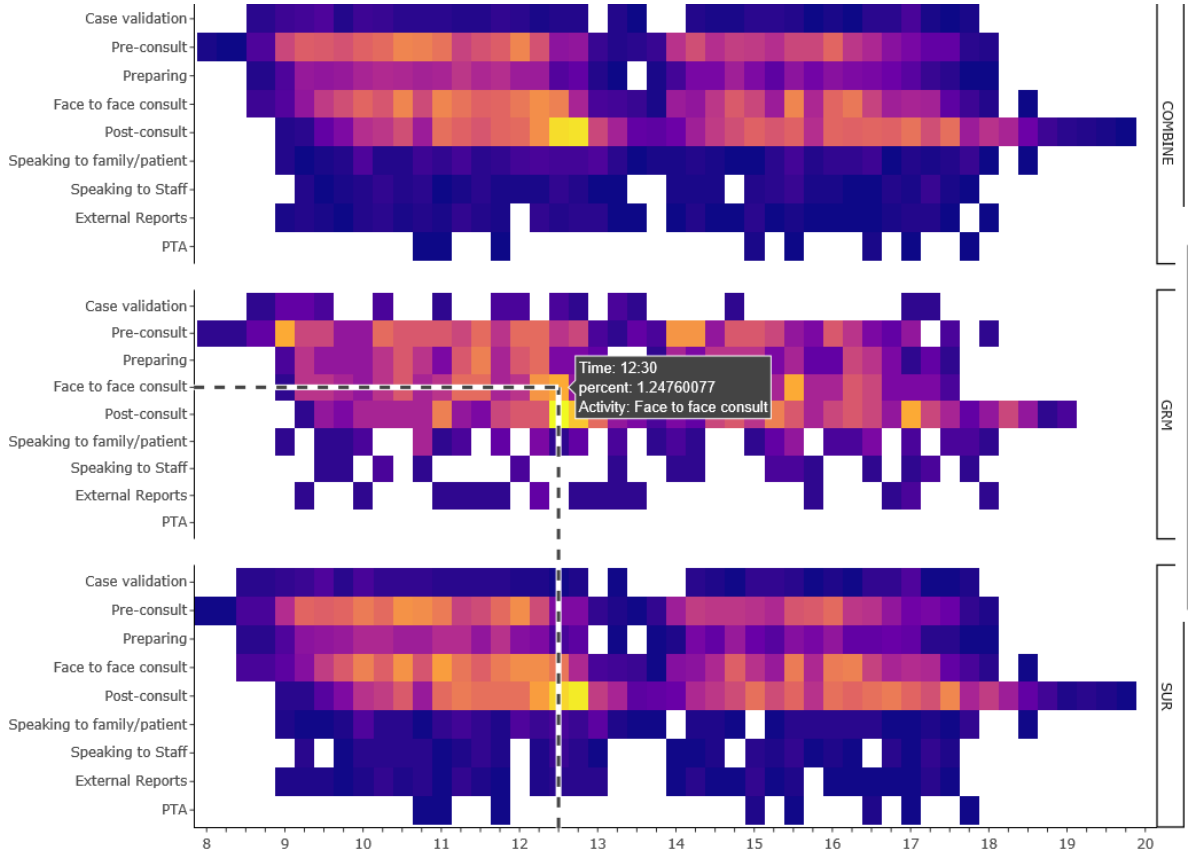
Time utilisation

- Billings needed to capture duration of case management
- Documentation which is a modifiable variable was streamlined

Lessons Learnt (real time data)

Power of real time data
-> more accurate

Detailed collection
-> allows for more granular analysis



Lessons Learnt (technology)

Selecting the most appropriate technology rather than the trendiest technology

Commercial apps were available but had limitations:

- Cost
- Time taken to educate therapists on the use of commercial app

"Re-create" the functions on a familiar platform

Significance

- Results from the time motion study allowed us to understand productivity better
  - ➢ workload optimization and appropriate resource allocation.

- Real time data entry allowed for more meaningful understanding of operations and workflow.

Reference:

Janssenswillen, G., Depaire, B., Swennen, M., Jans, M., & Vanhoof, K. (2019). bupaR: Enabling reproducible business process analysis. *Knowledge-Based Systems*, *163*, 927-930.

Special Acknowledgements :

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Drowning in Data, Thirsty for Knowledge: Upscaling Changi General Hospital Speech Therapist's Understanding of Data Science