

# **Real time hospital beds data in hand**

## **Hospital Bed Management Dashboard**



APeHRC 2016



Dr K L CHUNG<sup>b</sup>  
Dr Ian CHEUNG<sup>c</sup>  
Dr Steve CHAN<sup>d</sup>

Vicky FUNG<sup>a</sup>  
Veronica HUNG<sup>a</sup>  
Dick LAM<sup>e</sup>  
Olivia LEUNG<sup>a</sup>

<sup>b</sup> North District Hospital, Hospital Authority  
<sup>c</sup> Cluster Services Division, Hospital Authority  
<sup>d</sup> Tuen Mun Hospital, Hospital Authority

<sup>a</sup> Health Informatics Section, Hospital Authority  
<sup>e</sup> Information Technology Division, Hospital Authority



# Overview

**Current situation in hospitals**

**Dashboard the solution**

**Conclusion**



- Amy
- General nursing manager
- Orange Hospital
- Need to know the full picture of hospital beds occupancy



Medical manager



Surgery manager



ICU manager



2C



2D



3A



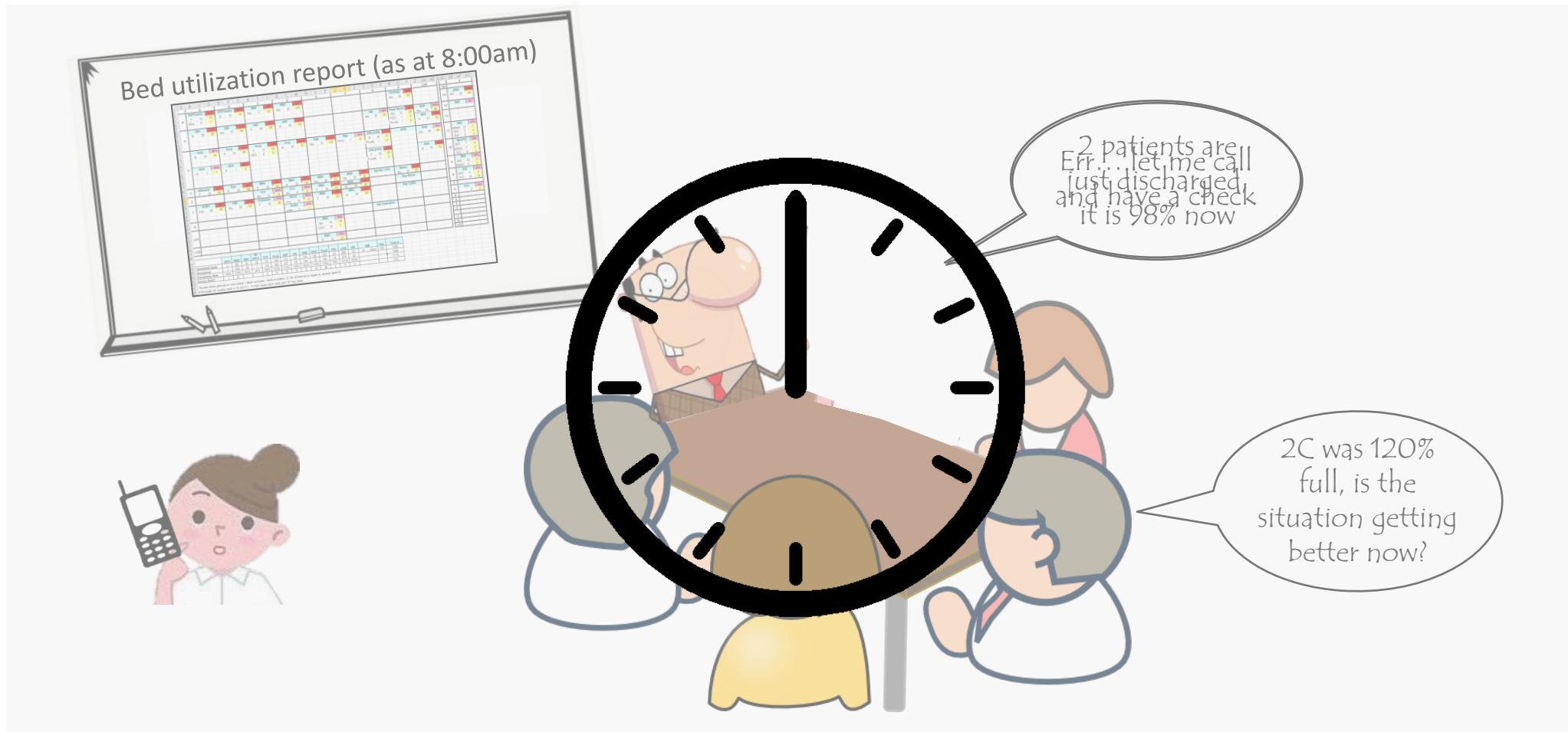
- Gordon
- Medical wards manager
- Orange Hospital
- In charge of all medical wards

# Daily meeting with senior management

09:00

DEC  
21

Winter surge

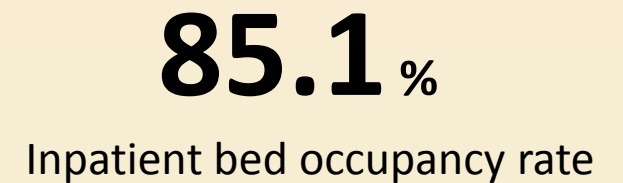
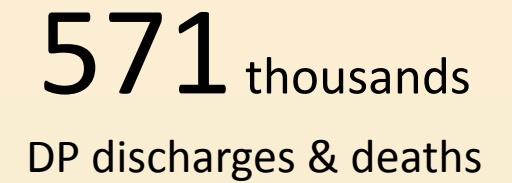
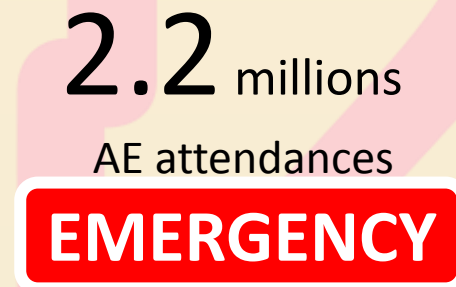
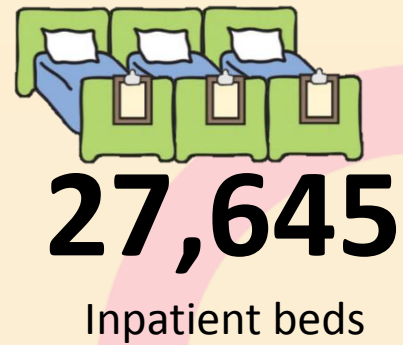


Not real  
time

Manual

Accessible  
in office  
only







## Real-Time 1

### Overflow Bed Summary

**Admission**  
(9:00am of previous d  
9:00am)

Emergency

Status as at 26-Mar

Dept.	Type
-------	------

MED

Ward	Code	Occur
2B		
8B		
DSC		
11A		
11B		
12A		
12B		1
13A		4
13B		47
2A		23
5C		56
5D		57
5E		25
CCU		3
HDU		1
ICU		5
PCD		2
RENA		6
10AG		0
10A		27
10B		22
6C		44
6D		47
7A		31
7B		48
Total		693

	MED
SUR	Female

Hospital											
Date: 28/05/2015											
No. of Vaca											
Ward	Specialty	Male Ward				BDO					
		BDO	Effective BDA	Occupancy Rate	Vacant Beds Available						
IF	M&G	22									
	SUR	5									

### Hospital - Daily Bed Utilization Report

**Date: 28/05/2015 (Thu) Hours 23:59**

No. of Vacant Bed : 67

[illegible][illegible]

	DEN	M&G	MID	TB (MRE 3)	ICU	Surg	O&T	NS	O&G	ONC	Paed	PID	LKB	EM	A&E	Day	Total #
Scheduled beds	2	381	32	28	18	144	112	26	104	68	120	24	268	32	14	(obs)	1359
Occupancy	3	452	29	7	18	192	127	35	104	76	142	19	270	32			1506
Occupancy Rate	150%	119%	91%	25%	100%	133%	113%	135%	100%	112%	116%	79%	101%	100%			111%
Excess Beds*	1	81	0	0	0	51	15	9	9	10	26	0	11	0			213

\*Excess Beds (derived on ward basis) = Beds occupied - Beds available (if the difference is negative, excess beds=0)

# Excludes 40 nursery beds in A3 and C1, 14 A&E observation beds and 157 day beds.

Total Available beds	0
	661

5	3	52	8%
0	0	27	0%
0	0	1	0%
1	0	15	6%
1	0	28	3%
7	3	123	5%

~ AE admission rate: 22.8%



**Governance**

**Bed Management System  
Working Group**

Prioritize ruthlessly  
(first things first)

Embrace your Informaticians  
(and feed them well)



The customer is always right  
(well, almost)

Medical is an art and a science  
(and so is medical informatics)



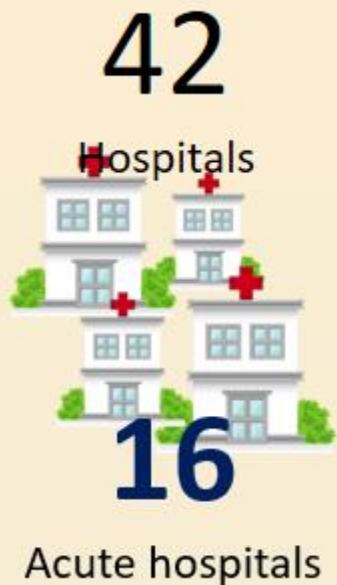
## Seven principles for health informatics success

Source:

Cheung NT, Fung V, et al. Principles-based medical informatics for success: How Hong Kong built one of the world's largest integrated longitudinal electronic patient records.

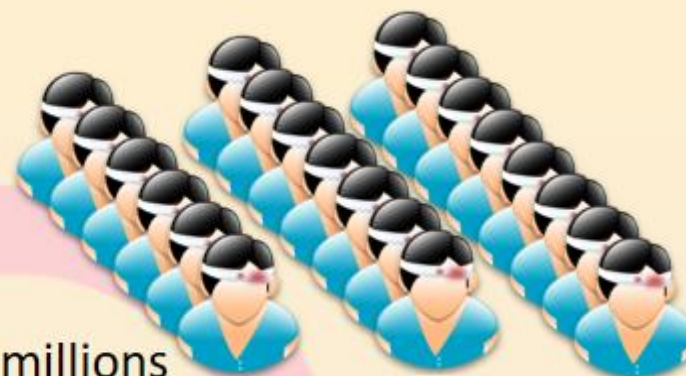
Presented at Medinfo 2007, Brisbane, Australia;307-10.





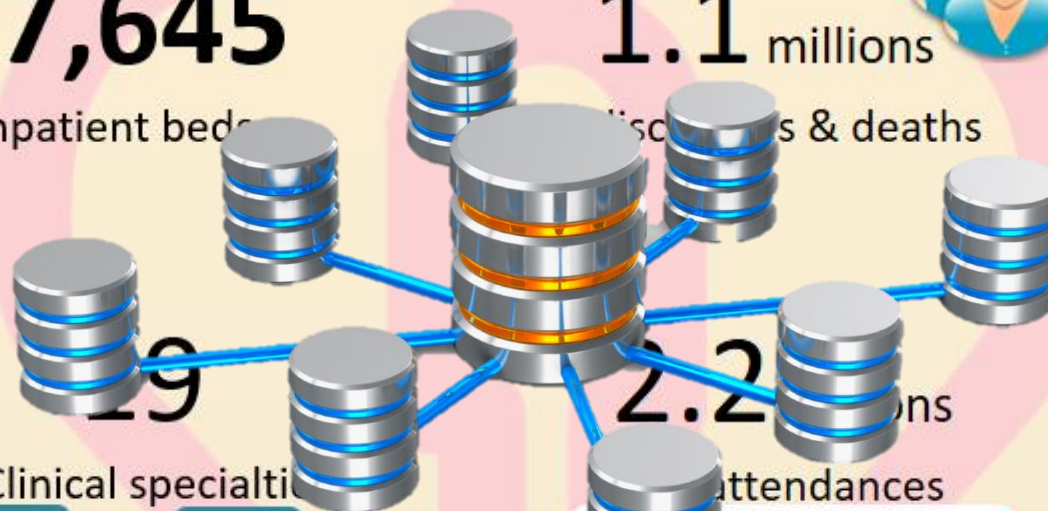
**27,645**

Inpatient beds



**1.1** millions  
Discharges & deaths

**571** thousands  
DP discharges & deaths



Medicine ICU  
Orthopedics  
Surgery Obstetric & gynaecology  
Cardiothoracic surgery Paediatrics  
Oncology

**EMERGENCY**

**85.1%**  
Inpatient bed occupancy rate





# **Hospital Bed Management Dashboard**





醫院管理局  
HOSPITAL  
AUTHORITY

## Hospital Bed Management Dashboard

Welcome CORP\CHANTM [Logout]  
Tai Man Chan, HOIT&HI SM(HDMB)

Report status as at : 21-06-2016 / 10:39:52

[Refresh this page](#)

[Print this page](#)

### A. Hospital Total

Hospital

Group by ☐ Ward Location ☒ Department

[Submit](#)

[Reset](#)

OH 20/06/2016 08:00 - 21/06/2016 07:59 (Retrieved at : 21-06-2016 10:39)

AE Attendance	Admission			Discharge		
	Elective	Emergency	Total	Discharge (excl'd death)	Other hospital	Death
548	245	203	448	411	27	7

OH 21/06/2016 08:00 - 21/06/2016 10:39 (Retrieved at : 21-06-2016 10:39)

AE Attendance	Admission			Discharge		
	Elective	Emergency	Total	Discharge (excl'd death)	Other hospital	Death
79	84	13	97	7	1	2

B. The following 'by-ward analyses' are confined only to wards with IP beds (i.e. excluding wards with day beds only)

[\[+\] Expand All](#)

[\[-\] Collapse All](#)

MED	SUR	O&G	PAED	O&T	ICU					
Ward Location	Ward Code	Sex	Specialty	No. of patients (a)	Scheduled IP Beds (b)	Patient to IP Bed Ratio (a)/(b)	Scheduled day beds (c)	Patient to Total Bed Ratio (a)/[(b)+(c)]	Overflow	
7B	7B	Female	SUR	37	46		0		MED	
		Female	Others	4					4 + 0	
		7B Female Sub Total		41	46		0			
		7B Total (Ward Location)		41	46	89%	0			
8A	8A	Mixed	SUR	45	45		0			
		Mixed	Others	1					1 + 0	
		8A Mixed Sub Total		46	45		0			
		8A Total (Ward Location)		46	45	102%	0			

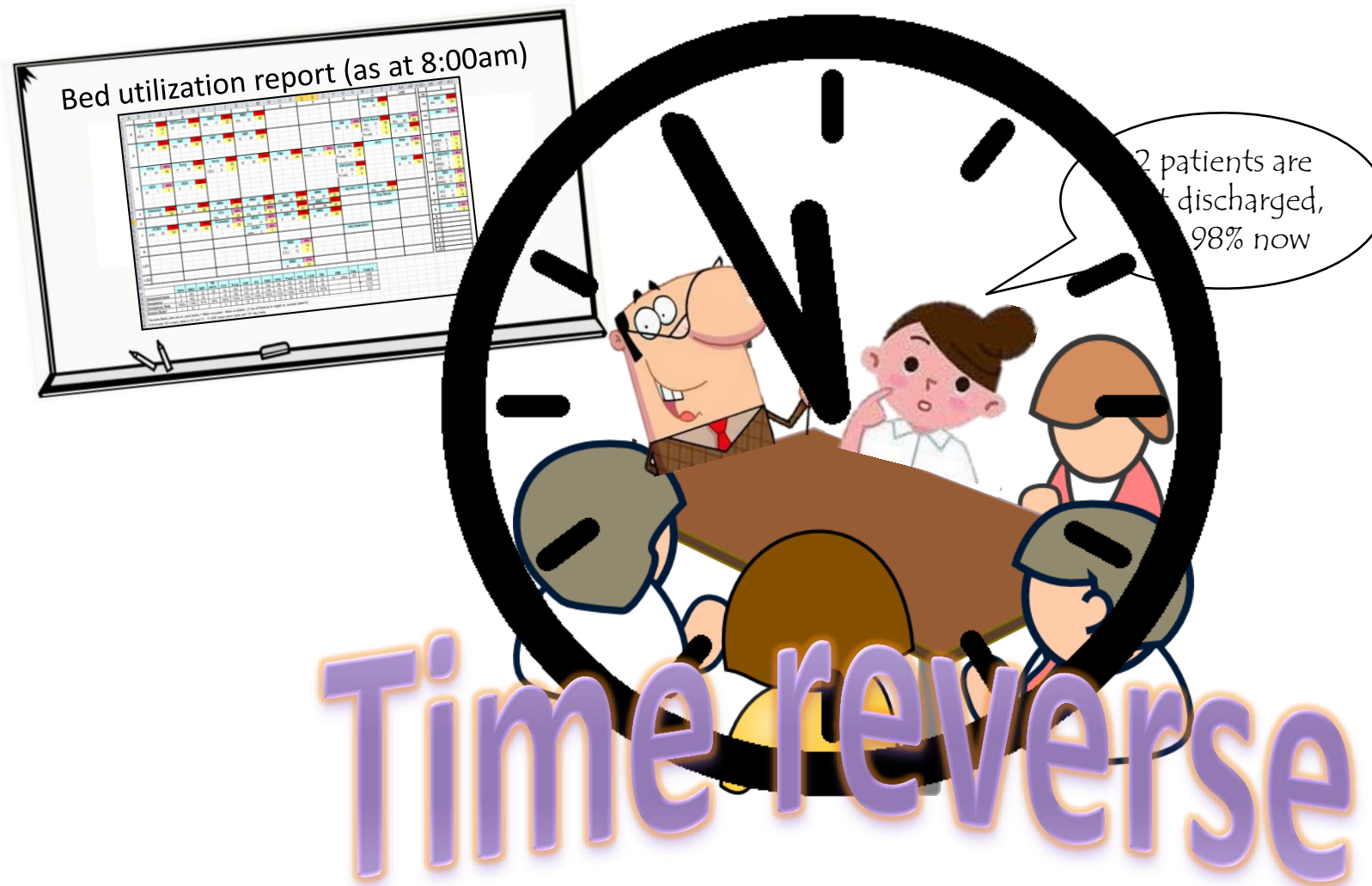


# Daily meeting with senior management

09:00

DEC  
21

Winter surge

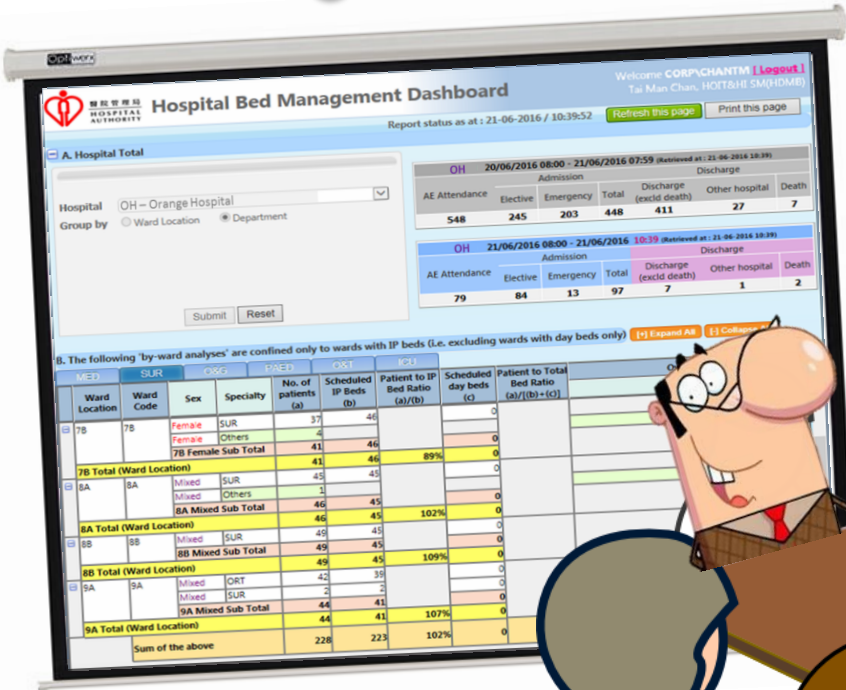


# Daily meeting with senior management

09:00

DEC  
21

Winter surge



Let's check the real time Dashboard

How's the situation of 2C?

# Daily meeting with senior management

09:00



醫院管理局  
HOSPITAL  
AUTHORITY

## Hospital Bed Management Dashboard

### A. Hospital Total

Hospital

Group by

Ward

Location

--- Please select hospital ---

ACH – Apple Children Hospital

BMC – Banana Medical Centre

GKH – Golden Kiwi Hospital

OH – Orange Hospital

SH – Strawberry Hospital

Submit

Reset

Select hospital



Welcome **CORP\CHANTM** [[Logout](#)]  
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Report status as at : 27-06-2016 / 15:06:38

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**A. Hospital Total**

**Hospital** OH – Orange Hospital

**Group by** ☒ Ward Location ☐ Department

**Ward Location**

1A  
2A  
2B  
2C

☒ Select all

Select All:  
1A, 2A, 2B, 2C, 2D, 3A, 3APB, 3API, 3B, 3BAD, 3BAN, 3BGL, 3BGY, 3BMG, 3BN, 3BP, 3BPH, 3BPI, 3C, 3CA, 3CR, 3D, 3E, 4A, 4AOB, 4B, 4BAN, 4BGD, 4BGY, 4EM.


**B. The following 'by-ward analyses' are confined only to wards with IP beds (i.e. exclude wards with day beds only)** [\[+\] Expand All](#) [\[-\] Collapse All](#)

## Part I

### Hospital Total

## Part II

### Bed Summary Table



醫院管理局  
HOSPITAL  
AUTHORITY

# Hospital Bed Management Dashboard

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Report status as at : 27-06-2016 / 15:06:38

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A. Hospital Total

Hospital

OH – Orange Hospital

Group by

☒ Ward Location ☐ Department

Ward Location

1A  
2A  
2B  
2C

Select all

Select All:

1A, 2A, 2B, 2C, 2D, 3A, 3APB, 3  
BP, 3BPH, 3BPI, 3C, 3D, 3E, 3F, 3G, 3H, 3I, 3J, 3K, 3L, 3M, 3N, 3O, 3P, 3Q, 3R, 3S, 3T, 3U, 3V, 3W, 3X, 3Y, 3Z, 4A, 4B, 4C, 4D, 4E, 4F, 4G, 4H, 4I, 4J, 4K, 4L, 4M, 4N, 4O, 4P, 4Q, 4R, 4S, 4T, 4U, 4V, 4W, 4X, 4Y, 4Z, 5A, 5B, 5C, 5D, 5E, 5F, 5G, 5H, 5I, 5J, 5K, 5L, 5M, 5N, 5O, 5P, 5Q, 5R, 5S, 5T, 5U, 5V, 5W, 5X, 5Y, 5Z, 6A, 6B, 6C, 6D, 6E, 6F, 6G, 6H, 6I, 6J, 6K, 6L, 6M, 6N, 6O, 6P, 6Q, 6R, 6S, 6T, 6U, 6V, 6W, 6X, 6Y, 6Z, 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, 7J, 7K, 7L, 7M, 7N, 7O, 7P, 7Q, 7R, 7S, 7T, 7U, 7V, 7W, 7X, 7Y, 7Z, 8A, 8B, 8C, 8D, 8E, 8F, 8G, 8H, 8I, 8J, 8K, 8L, 8M, 8N, 8O, 8P, 8Q, 8R, 8S, 8T, 8U, 8V, 8W, 8X, 8Y, 8Z, 9A, 9B, 9C, 9D, 9E, 9F, 9G, 9H, 9I, 9J, 9K, 9L, 9M, 9N, 9O, 9P, 9Q, 9R, 9S, 9T, 9U, 9V, 9W, 9X, 9Y, 9Z, 10A, 10B, 10C, 10D, 10E, 10F, 10G, 10H, 10I, 10J, 10K, 10L, 10M, 10N, 10O, 10P, 10Q, 10R, 10S, 10T, 10U, 10V, 10W, 10X, 10Y, 10Z, 11A, 11B, 11C, 11D, 11E, 11F, 11G, 11H, 11I, 11J, 11K, 11L, 11M, 11N, 11O, 11P, 11Q, 11R, 11S, 11T, 11U, 11V, 11W, 11X, 11Y, 11Z, 12A, 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58F, 58G, 58H, 58I, 58J, 58K, 58L, 58M, 58N, 58O, 58P, 58Q, 58R, 58S, 58T, 58U, 58V, 58W, 58X, 58Y, 58Z, 59A, 59B, 59C, 59D, 59E, 59F, 59G, 59H, 59I, 59J, 59K, 59L, 59M, 59N, 59O, 59P, 59Q, 59R, 59S, 59T, 59U, 59V, 59W, 59X, 59Y, 59Z, 60A, 60B, 60C, 60D, 60E, 60F, 60G, 60H, 60I, 60J, 60K, 60L, 60M, 60N, 60O, 60P, 60Q, 60R, 60S, 60T, 60U, 60V, 60W, 60X, 60Y, 60Z, 61A, 61B, 61C, 61D, 61E, 61F, 61G, 61H, 61I, 61J, 61K, 61L, 61M, 61N, 61O, 61P, 61Q, 61R, 61S, 61T, 61U, 61V, 61W, 61X, 61Y, 61Z, 62A, 62B, 62C, 62D, 62E, 62F, 62G, 62H, 62I, 62J, 62K, 62L, 62M, 62N, 62O, 62P, 62Q, 62R, 62S, 62T, 62U, 62V, 62W, 62X, 62Y, 62Z, 63A, 63B, 63C, 63D, 63E, 63F, 63G, 63H, 63I, 63J, 63K, 63L, 63M, 63N, 63O, 63P, 63Q, 63R, 63S, 63T, 63U, 63V, 63W, 63X, 63Y, 63Z, 64A, 64B, 64C, 64D, 64E, 64F, 64G, 64H, 64I, 64J, 64K, 64L, 64M, 64N, 64O, 64P, 64Q, 64R, 64S, 64T, 64U, 64V, 64W, 64X, 64Y, 64Z, 65A, 65B, 65C, 65D, 65E, 65F, 65G, 65H, 65I, 65J, 65K, 65L, 65M, 65N, 65O, 65P, 65Q, 65R, 65S, 65T, 65U, 65V, 65W, 65X, 65Y, 65Z, 66A, 66B, 66C, 66D, 66E, 66F, 66G, 66H, 66I, 66J, 66K, 66L, 66M, 66N, 66O, 66P, 66Q, 66R, 66S, 66T, 66U, 66V, 66W, 66X, 66Y, 66Z, 67A, 67B, 67C, 67D, 67E, 67F, 67G, 67H, 67I, 67J, 67K, 67L, 67M, 67N, 67O, 67P, 67Q, 67R, 67S, 67T, 67U, 67V, 67W, 67X, 67Y, 67Z, 68A, 68B, 68C, 68D, 68E, 68F, 68G, 68H, 68I, 68J, 68K, 68L, 68M, 68N, 68O, 68P, 68Q, 68R, 68S, 68T, 68U, 68V, 68W, 68X, 68Y, 68Z, 69A, 69B, 69C, 69D, 69E, 69F, 69G, 69H, 69I, 69J, 69K, 69L, 69M, 69N, 69O, 69P, 69Q, 69R, 69S, 69T, 69U, 69V, 69W, 69X, 69Y, 69Z, 70A, 70B, 70C, 70D, 70E, 70F, 70G, 70H, 70I, 70J, 70K, 70L, 70M, 70N, 70O, 70P, 70Q, 70R, 70S, 70T, 70U, 70V, 70W, 70X, 70Y, 70Z, 71A, 71B, 71C, 71D, 71E, 71F, 71G, 71H, 71I, 71J, 71K, 71L, 71M, 71N, 71O, 71P, 71Q, 71R, 71S, 71T, 71U, 71V, 71W, 71X, 71Y, 71Z, 72A, 72B, 72C, 72D, 72E, 72F, 72G, 72H, 72I, 72J, 72K, 72L, 72M, 72N, 72O, 72P, 72Q, 72R, 72S, 72T, 72U, 72V, 72W, 72X, 72Y, 72Z, 73A, 73B, 73C, 73D, 73E, 73F, 73G, 73H, 73I, 73J, 73K, 73L, 73M, 73N, 73O, 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96R, 96S, 96T, 96U,

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## A. Hospital Total

Hospital

Group by ☒ Ward Location ☐ Department

Ward Location   
2A  
2B  
2C ☒ Select all

Select All:  
1A, 2A, 2B, 2C, 2D, 3A, 3APB, 3API, 3B, 3BAD, 3BAN, 3BC, 3BGD, 3BGY, 3BMG, 3BN, 3BP, 3BPH, 3BPI, 3C, 3CA, 3CR, 3D, 3E, 4A, 4AOB, 4B, 4BAD, 4BAN, 4BGD, 4BGY, 4BM.

[Submit](#)

[Reset](#)

OH 26/06/2016 08:00 - 27/06/2016 07:59 (Retrieved at : 27-06-2016 15:06)						
AE Attendance	Admission			Discharge		
	Elective	Emergency	Total	Discharge (excl'd death)	Other hospital	Death
431	117	120	237	137	3	10

OH 27/06/2016 08:00 - 27/06/2016 15:06 (Retrieved at : 27-06-2016 15:06)						
AE Attendance	Admission			Discharge		
	Elective	Emergency	Total	Discharge (excl'd death)	Other hospital	Death
217	176	40	216	217	26	2

## B. The following 'by-ward analyses' are confined only to wards with IP beds (i.e. excluding wards with day beds only)

[\[+\] Expand All](#)

[\[-\] Collapse All](#)

	Ward Location	Ward Code	Sex	Specialty	No. of patients (a)	Scheduled IP Beds (b)	Patient to IP Bed Ratio (a)/[(b)+(c)]	Scheduled day beds (c)	Patient to Total Bed Ratio (a)/[(b)+(c)]	Overflow					
										ENT	GYN	MED	OPH	ORT	SUR
2C	2CG	Mixed	MED		20			0							
		2CG Mixed Sub Total			26	20		0							
		2CS	Mixed	MED		19	20								
			2CS Mixed Sub Total			19	20								
	2C Total (Ward Location)					35	40	88%							
2D	2DH	Mixed	HSP		15	15									
		2DH Mixed Sub Total			15	15									
		2DR	Mixed	REH		30	30		0						
			2DR Mixed Sub Total			30	30		0						
	2D Total (Ward Location)					45	45	100%							
3A	NICU	Mixed	NEO		14	10									
		NICU Mixed Sub Total			14	10		0							
		SCBU	Mixed	NEO		45	35		0						
			SCBU Mixed Sub Total			45	35		0						
	3A Total (Ward Location)					59	45	131%	0						

## Part II Bed Summary Table

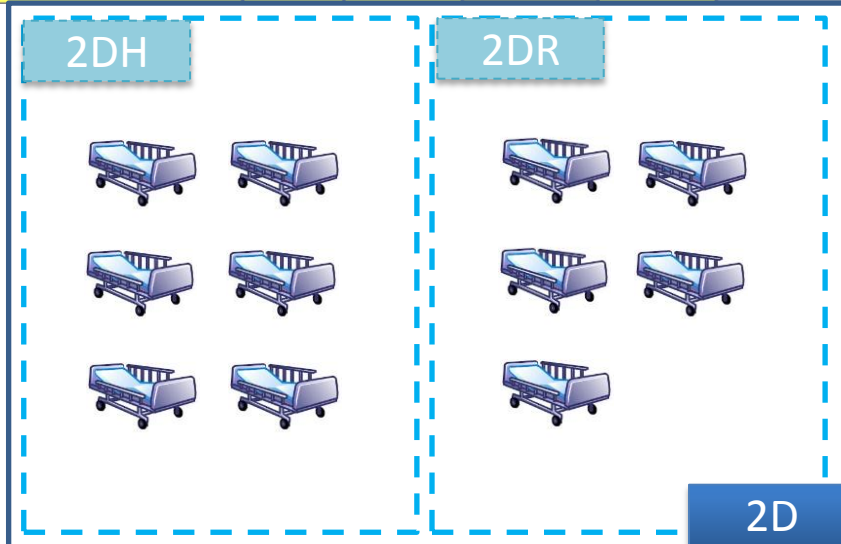


B. The following 'by-ward analyses' are confined only to wards with IP beds (i.e. excluding wards with day beds only) [+] Expand All [.] Collapse All

Ward Location	Ward Code	Sex	Specialty	No. of patients (a)	Scheduled IP Beds (b)	Patient to IP Bed Ratio (a)/(b)	Scheduled day beds (c)	Patient to Total Bed Ratio (a)/[(b)+(c)]	Overflow					
									ENT	GYN	MED	OPH	ORT	SUR
2C	2CG	Mixed	MED	16	20		0							
		2CG Mixed Sub Total		16	20		0							
	2CS	Mixed	MED	19	20		0							
		2CS Mixed Sub Total		19	20		0							
	2C Total (Ward Location)				35	40	88%	0						
2D	2DH	Mixed	HSP	15	15		0							
		2DH Mixed Sub Total		15	15		0							
	2DR	Mixed	REH	30	30		0							
		2DR Mixed Sub Total		30	30		0							
	2D Total (Ward Location)				45	45	100%	0						
3A	NICU	Mixed	NEO	14	10		0							
		NICU Mixed Sub Total		14	10		0							
	SCBU	Mixed	NEO	45	35		0							
		SCBU Mixed Sub Total		45	35		0							
	3A Total (Ward Location)				59	45	131%	0						

**Subtotal**  
(by ward code)

**Total**  
(by ward location)



**2D** Ward location

**2DH** Ward code

Ward location

A group of hospital beds for patient care under the same physical location, usually under the same nursing team management



# Patient admission

09:00

11:00

Too bad, long queue for admission. Better call ward managers to discharge patients



B. The following 'by ward analyses' are confined only to wards with IP beds (i.e. excluding wards with day beds only) [\[+\] Expand All](#) [\[-\] Collapse All](#)

	Ward Location	Ward Code	Sex	Specialty	No. of patients (a)	Scheduled IP Beds (b)	Patient to IP Bed Ratio (a)/(b)	Scheduled day beds (c)	Patient to Total Bed Ratio (a)/[(b)+(c)]	Overflow					
										ENT	GYN	MED	OPH	ORT	SUR
6B	6B		Mixed	MED	52	40		0							
			6B Mixed	Sub Total	52	40		0							
			6B Total (Ward Location)		52	40	130%	0							
7A	7A		Male	SUR	39	46		0							
			7A Male	Sub Total	39	46		0							
			7A Total (Ward Location)		39	46	85%	0							
7B	7B		Female	SUR	32	46		0							
			Female	Others	3							3 + 0			
			7B Female	Sub Total	35	46		0							
			7B Total (Ward Location)		35	46	76%	0							
8A	8A		Mixed	SUR	42	45		0						3 + 1	
			Mixed	Others	4							3 + 1			
			8A Mixed	Sub Total	46	45		0							
			8A Total (Ward Location)		46	45	102%	0							



Waiting for admission

## Sex

- Male
- Female
- Mixed: Male & Female



B. The following 'by-ward analyses' are confined only to wards with IP beds (i.e. excluding wards with day beds only) [\[+\] Expand All](#) [\[-\] Collapse All](#)

	Ward Location	Ward Code	Sex	Specialty	No. of patients (a)	Scheduled IP Beds (b)	Patient to IP Bed Ratio (a)/(b)	Scheduled day beds (c)	Patient to Total Bed Ratio (a)/[(b)+(c)]	Overflow					
										ENT	GYN	MED	OPH	ORT	SUR
<input checked="" type="checkbox"/>	6B	6B	Mixed	MED	52	40		0		Overflow specialties					
			6B Mixed Sub Total		52	40		0							
	6B Total (Ward Location)				52	40	130%	0							
<input checked="" type="checkbox"/>	7A	7A	Male	SUR	39	46		0							
			7A Male Sub Total		39	46		0							
	7A Total (Ward Location)				39	46	85%	0							
<input checked="" type="checkbox"/>	7B	7B	Female	SUR	32	46		0		<div>3 + 0</div>					
			Female	Others	3										
			7B Female Sub Total		35	46		0							
	7B Total (Ward Location)				35	46	76%	0							
<input checked="" type="checkbox"/>	8A	8A	Mixed	SUR	42	45		0		<div>3 + 1</div>					
			Mixed	Others	4										
			8A Mixed Sub Total		46	45		0							
	8A Total (Ward Location)				46	45	102%	0							



B. The following 'by-ward analyses' are confined only to wards with IP beds (i.e. excluding wards with day beds only) [\[+\] Expand All](#) [\[-\] Collapse All](#)

	Ward Location	Ward Code	Sex	Specialty	No. of patients (a)	Scheduled IP Beds (b)	Patient to IP Bed Ratio (a)/(b)	Scheduled day beds (c)	Patient to Total Bed Ratio (a)/[(b)+(c)]	Overflow											
										ENT	GYN	MED	OPH	ORT	SUR						
[-]	6B	6B	Mixed	MED	52	40		0													
			6B Mixed Sub Total		52	40		0													
			6B Total (Ward Location)		52	40	130%	0													
[-]	7A	7A	Male	SUR	39	46		0													
			7A Male Sub Total		39	46		0													
			7A Total (Ward Location)		39	46	85%	0													
[-]	7B	7B	Female	SUR	32	46		0													
			Female	Others	3													3 + 0			
			7B Female Sub Total		35	46		0													
			7B Total (Ward Location)		35	46	76%	0													
[-]	8A	8A	Mixed	SUR	42	45		0													
			Mixed	Others	4															3 + 1	
			8A Mixed Sub Total		46	45		0													
			8A Total (Ward Location)		46	45	102%	0													
		Sum of the above			1133	1218	93%	83	87%	0 + 1	14 + 9	0 + 2	3 + 2	0 + 3							
										34											

No worries, the overall ratio looks not too bad (93%)

So many overflow?!





# Hospital Bed Management Dashboard

Welcome CORP\CHANTM [Logout]  
Tai Man Chan, HOIT&HI SM(HDMB)

Report status as at : 27-06-2016 / 15:06:38

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## A. Hospital Total

Hospital

Group by ☐ Ward Location ☒ Department

Ward Location



# During ward supervision

09:00

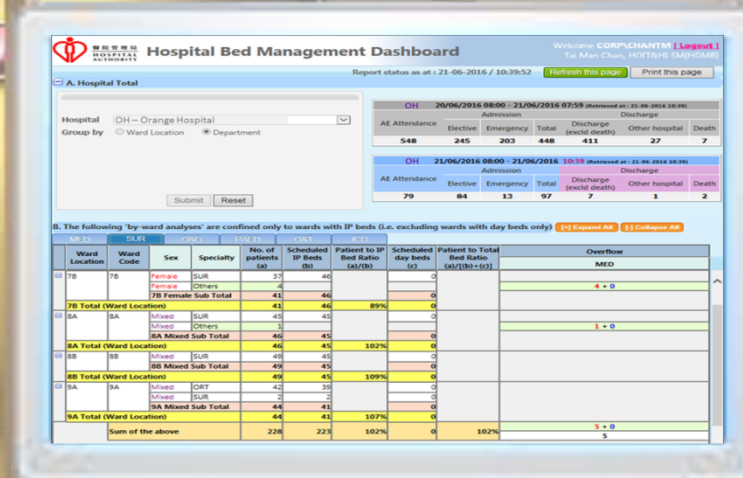
11:00

12:00

14:00



What's the bed utilization now?



Accessible in any computers in hospital  
(with intranet)





09:00

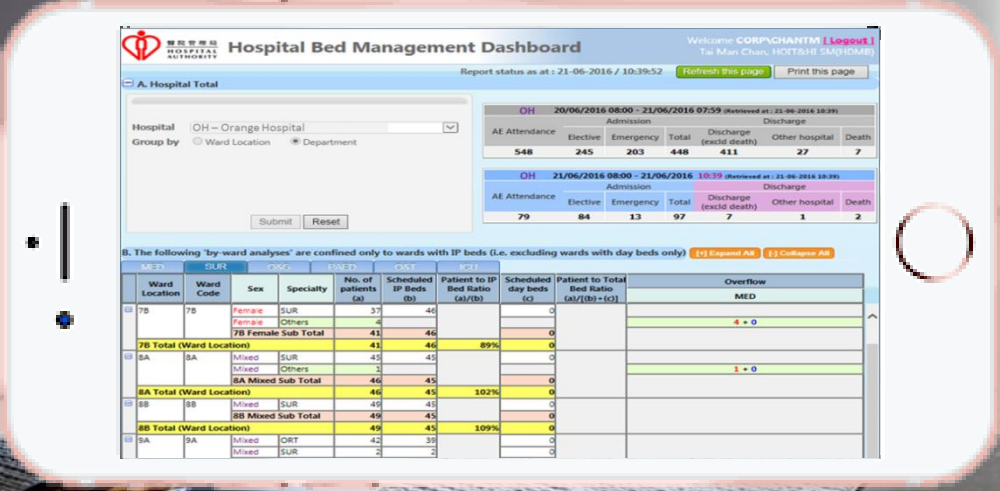
11:00

12:00

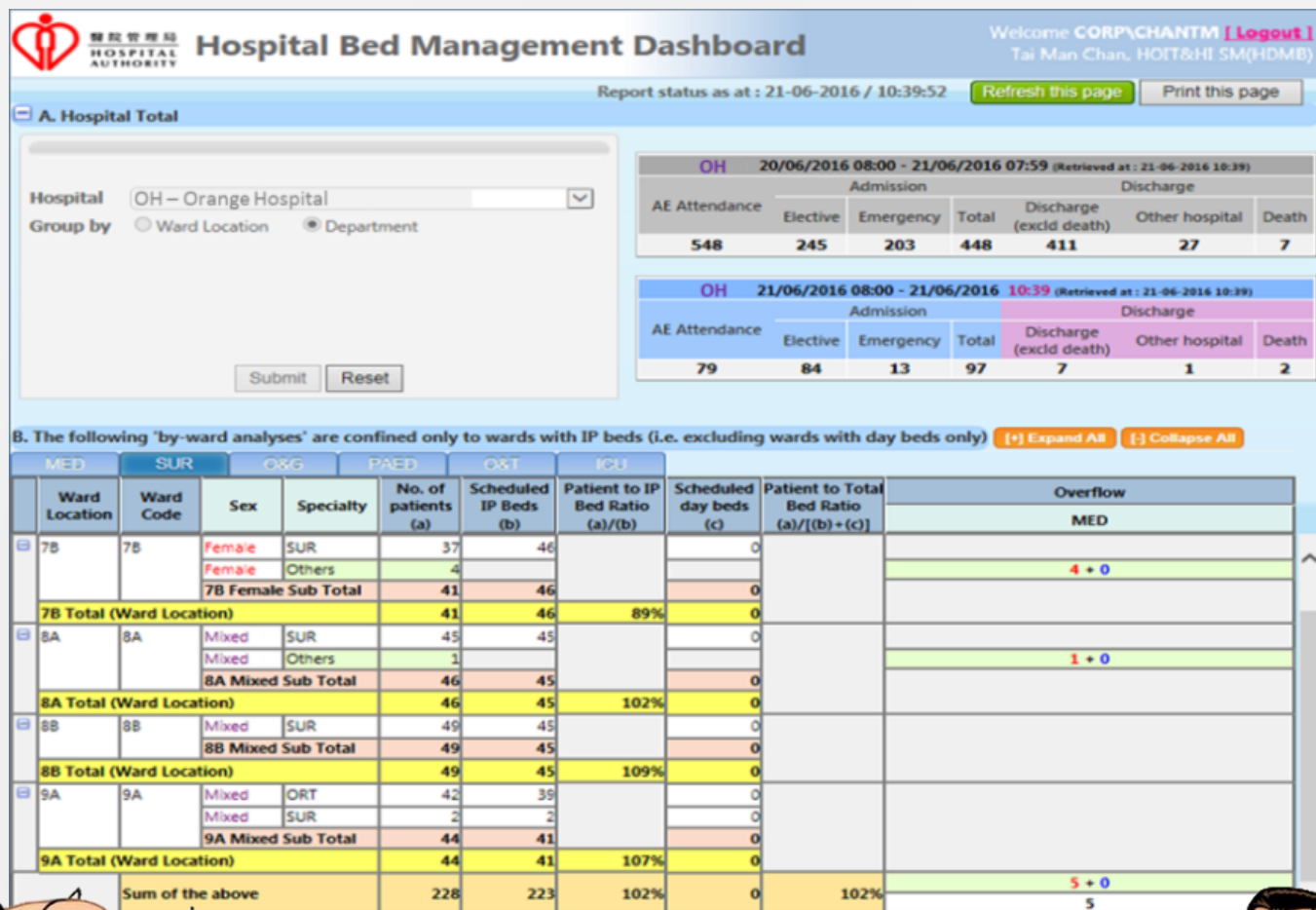
14:00

23:00

What's the bed situation now?



Accessible with any mobile device (via internet)



Hospital  
management



General nursing manager  
(Bed manager)



Ward manager

**It relieves me from  
keep calling to check  
the bed vacancies**

*I can even  
check it  
at home  
with my mobile*

*I can control  
which of my  
staff can access  
the Dashboard!*

*I don't have  
to wait for  
gam report  
anymore*

**Love the  
department  
grouping!**

*Friendly  
design*

*Easy to use*

**Real-time**



# Challenges

- Various operational practices among hospitals
- Different users different focus







*Hospital Bed  
Management  
Dashboard*





FROM individual hospital-based reports  
TO a single corporate-based report

# Hospital Bed Management Dashboard

Real-time bed situation

Access anywhere anytime





Thank you!