GlobalHealth Lab

class 4 Process Improvement

Spring 2013

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and colleagues

Readings assigned for today

Rajaram, Kumar, Sonia Benavides, Jessica Bonham, Carine Ireland, Nina Pelham and Mai Yaguchi. 2010. "Nairobi District Hospital" *UCLA/Johnson & Johnson Management Development Institute and the UCLA Anderson School of Management case.* [web]

Ramdas, Kamalini, Elizabeth Teisberg, and Amy L. Tucker. 2012. "Four Ways to Reinvent Service Delivery." *Harvard Business Review*, December. [web]

Graban, Mark, Kai Nexus, and Joe Swartz. 2012. "Feel Human Again." *Six Sigma Forum Magazine*, November: 16-20.

Dasu, Sriram and Richard B. Chase. 2010. "Designing the Soft Side of Customer Service." *MIT Sloan Management Review*, Fall: 33-39.

Optional

Duncan, Allan K, and Margaret A. Breslin. 2009. "Innovating health care delivery: The design of health services." Journal of Business Strategy, Vol. 30 No. 2/3: 13-20.

Gawande, Atul. 2007. "The Checklist." The New Yorker. (10 pages.)

Rajaram, Kumar. 2010. "Fundamentals of Operations Management for Health Care Organizations." Decisions, Operations and Technology Management Area UCLA Anderson School of Management working paper. (33 pages.)

Plan for today

- Quick notes
  - CFK and Muthaiga team writeups
  - Resources for workplans, plus more on context
- Nairobi District Hospital
  - Problem framing, process flow, capacity assessment
  - Opportunities for improvement
  - Process improvement in healthcare delivery
- 10 minutes to meetup on country briefings
- Coming up:
  - Draft workplan Friday
  - Mentor Meetings: workplan review next week
  - Get ticketing, now that visas & travel medical appts underway
  - No class next Tuesday
  - Just a case for next Thursday!

Nairobi District Hospital

What are the problems?

Case: Rajaram, Kumar, Sonia Benavides, et al. "Nairobi District Hospital." UCLA/Johnson & Johnson Management Development Institute and the UCLA Anderson School of Management Case, 2010.

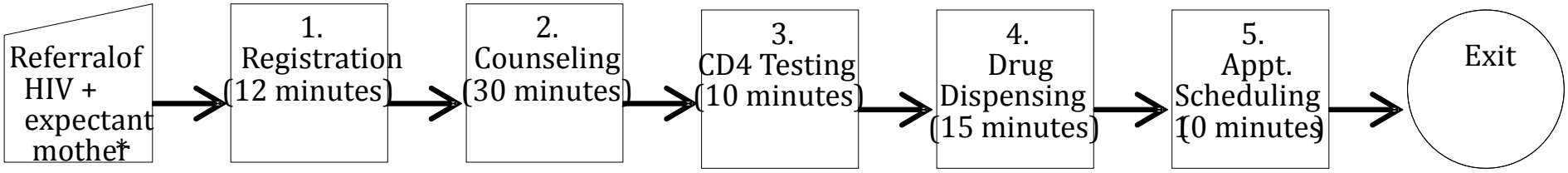
Nairobi District Hospital CCC Floor Plan

Floor plan of CCC at Nairobi District Hospital removed due to copyright restrictions.
Source: Exhibit 7 in Rajaram, Kumar, Sonia Benavides, et al. "Nairobi District Hospital." UCLA/Johnson & Johnson Management Development Institute and the UCLA Anderson School of Management Case, 2010.

Outline Of Case Analysis

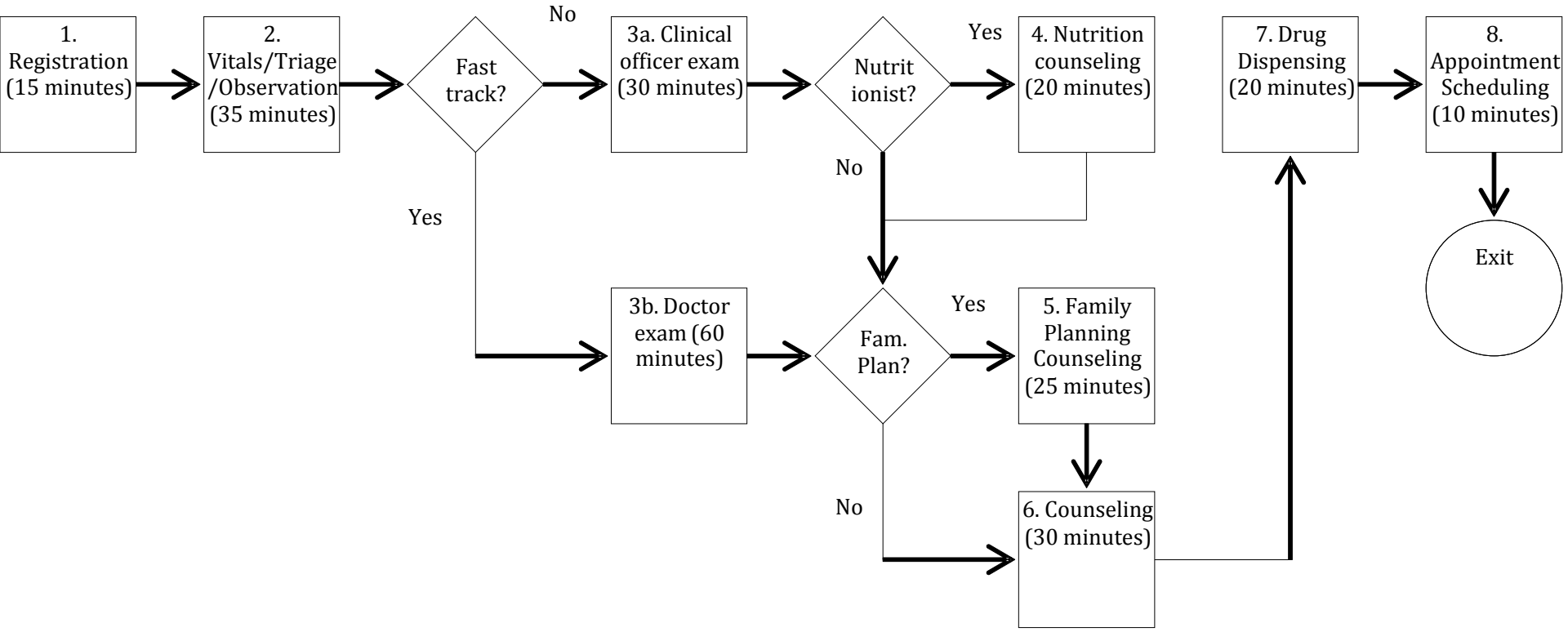
- "3 Cs"
  - "Company": Nairobi District Hospital
  - "Customer"
  - "Competition"
- Process Audit
  - Process Flow Diagram
  - Process Analysis: Determining capacity/utilization at stages and identifying the bottleneck
  - Little's Law: How many patients at the facility?
- Improvement Opportunities
  - How to scale up capacity?
  - How to reduce patient lead times?
  - How to reduce patient defaults and increase patient retention ?
- Lessons Learned

Process Flow Diagram for Initial Appointment



*Most expectant mothers were referred to the CCC after testing positive for HIV during their initial ANC visit.

Process Flow Diagram for Follow-up Appointment



How many patients per day?

- 20 new
- 90 scheduled for follow up
  - 78% show up at follow up (from case)
  - 70 follow ups per day

Insight: document assumptions extremely clearly

Table 1
Combine Exhibit 9 with Exhibit 8

Resource	Initial Appointment	Follow-up Appointment	Total Visits by Resource
Registration	100%	100%	90
Observations/Vitals/Triage	—	100%	70
CD4 Testing	100%	—	20
Clinical Officer	—	95%	66.5
Doctor	—	5%	3.5
Nutritionist	—	25%	18
Family Planning	—	15%	11
Counselor	100%	100%	90
Drug Dispensing	100%	100%	90
Appt. Scheduling	100%	100%	90
Beds	—	100%	70
Total Visits	**20**	**70**	

Table 2
Capacity of Each Resource in the Process

Stage	No. of Servers	Processing Times (Minutes)	Total Available Time (Hours)	Capacity (patients/day)
Registration	2	14	9	77
Observations/ Vitals/Triage	6	35	9	93
CD4 Testing	1	10	9	54
Clinical Officer	8	30	9	144
Doctor	1	60	9	9
Nutritionist	1	20	9	27
Family Planning	1	25	9	22
Counselor	6	30	9	108
Drug Dispensing	3	15	9	108
Appointment Scheduling	2	10	9	108
Beds	5	35	9	77

Table 3
Utilization at Each Stage: Identifying the Bottleneck

Stage	Patient Visits (from Table 1)	Capacity (from Table 2)	Utilization (Patient Visits/Capacity)
Registration	90	77	117%
Observations/Vitals/Triage	70	93	75%
CD4 Testing	20	54	37%
Clinical Officer	66.5	144	46%
Doctor	3.5	9	39%
Nutritionist	18	27	67%
Family Planning	11	22	50%
Counselor	90	108	83%
Drug Dispensing	90	108	83%
Appointment Scheduling	90	108	83%
Beds	70	77	91%

How many patients at the clinic on average?

- Apply Little's Law: Lead Time = WIP x Cycle Time
- WIP at each visit type= Lead Time for Visit/Cycle Time at Visit
- Lead Time for visit type= Given in Exhibit 9
- Cycle time for visit type:
  - Assume patients arrive between 8 am to 5 pm or 9 hours or 540 minutes
  - Cycle time for visit type= 540/# of visits for type (Exhibit 9)
- Therefore:

  WIP at each visit type = Lead Time for Visit* # of Visits/540

How many patients at the clinic on average?

Visit type	# visits	Total time spent (Minutes)	# in clinic
Provider	20	222	8.2
Nursing	70	327	42.4
Overall			**50.6**

Table 4
What happens when patients increase by 15%?

Got by Scaling Table 2 by 15%

Resource	Initial Appointment	Follow-up Appointment	Total Visits by Resource
Registration	100%	100%	103.5
Observations/Vitals/Triage	—	100%	80.5
CD4 Testing	100%	—	23.0
Clinical Officer	—	95%	76.5
Doctor	—	5%	4.0
Nutritionist	—	25%	20.7
Family Planning	—	15%	12.7
Counselor	100%	100%	103.5
Drug Dispensing	100%	100%	103.5
Appt. Scheduling	100%	100%	103.5
Beds	—	100%	80.5
Total Visits	**23**	**80.5**	

Table 5
Impact of 15% increase in patients on utilization at each stage

Stage	Patient Visits (From Table 4)	Capacity (From Table 2)	Utilization (Patient Visits/Capacity)
Registration	103.5	77	134%
Observations/Vitals/Triage	80.5	93	87%
CD4 Testing	23.0	54	43%
Clinical Officer	76.5	144	53%
Doctor	4.0	9	44%
Nutritionist	20.7	27	77%
Family Planning	12.7	22	58%
Counselor	103.5	108	96%
Drug Dispensing	103.5	108	96%
Appointment Scheduling	103.5	108	96%
Beds	80.5	77	105%

How to increase capacity?

Addressing bottlenecks

Increase capacity of bottleneck: the clerks at reception

- Hire more clerks during peak hours.
- Arrange training to complete tasks faster.
- Automate transfer of information from the ANC to the CCC clinic.
- Start earlier.

Another potential bottleneck includes the beds, counselor, appointment scheduling and drug dispensing. You can consider moving the bed in the doctor's office to another room to increase effective capacity of beds. For the other stages, it is important to train, automate and improve information flows.

Reduce bottleneck utilization

Pool clerks at reception and appointment scheduling to increase effective capacity and reduce utilization at the reception.

Pool all beds, which will increase effective capacity and reduce utilization of the beds.

Consider the six counselors (this issue is missing from the analysis above). Rather than allocating returning counselors to patients they have previously seen, creating uneven workload, you could allocate even returning customers to the first available counselor. Bear in mind: you have to ensure that medical continuity is not lost.

Addressing variability

Reduce Variability in Arrivals

- Call people day before appointment to reduce no shows.
- Separate initial and follow up visits at reception.
- Separate simple and complex cases.
- Understand periods when walk-ins can be high and schedule fewer appointments for then.

Reduce Variability in Service

- Develop best practices at each stage.
- Offer training to ensure best practices are made.
- Have well explained procedures.
- Automate information flows.
- Automate medical procedures using technology.
- Combine or eliminate steps.
- Try to achieve low employee turnover.
- Cross-train workers.

IS IT ALL ABOUT INCREASING CAPACITY?

What else would you consider?

- Maternity ward
- Reduce loss to follow up/no shows
- Increase retention
- Increase the quality of overall patient experience.

Diagram of Nairobi District Hospital layout removed due to copyright restrictions. Source: Exhibit 5 in Rajaram, Kumar, Sonia Benavides, et al. "Nairobi District Hospital." UCLA/Johnson & Johnson Management Development Institute and the UCLA Anderson School of Management Case, 2010.

Country briefings

Economy and Business Climate

- Macroeconomic, human development, and other broad indicators
- Demography, geography
- Trade, assets, and regional and global economic role and relations
- Regulatory environment
- Region of the country: Your project locale vs. the nation
- Must equip readers to consider: What is the impact of the business climate on enterprises' roles in delivering health care?

Health

- Health indicators, prevalence of diseases, other measures
- Health systems: overview
- Current health issues in the country
- Access to care, health equity
- Must equip readers to consider: What is the impact of public health and health system issues on enterprises' roles in delivering health care?

History, culture, society, politics, education

- Overview of the nation's history and recent events
- Music, food, and other aspects of its culture
- Recent changes in country's culture
- Ethnic groups, languages
- How social factors may affect health issues
- Must equip readers to consider: What is the impact of culture on enterprises' roles in delivering health care?

Meetup!

- Kenya
- Tanzania and Zambia
- South Africa
- India
- Bangladesh and Nepal

15.S07 GlobalHealth Lab

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