

CLINIC SURGE PLANNING MODEL

USER'S GUIDE

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Institute for Systems Research

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Introduction

The Clinic Surge Planning Model (CSPM) is intended to grant public health officials the ability to quickly create an accurate model that will provide immediate assistance with planning for a treatment campaign. The model can be used either in the advance planning stages of a campaign or for support during an active effort. In general this model is designed to assist in planning a clinic with improved efficiency and performance while enlightening the planners on what to expect in the event of an outbreak.

This surge planning model allows clinic planners to enter known population information, along with an estimated surge, and set time constraints specific to their application. Immediate results show detailed clinic information regarding closing time, average number of patients in the clinic, and time a patient will spend in the clinic. Adjustments can easily be made to staffing levels and other inputs until the user is satisfied with the efficiency of the clinic. The versatility of this model allows the user to accept default values if little information is known about their clinic, or input more detailed information such as routing probabilities and process times. Since the model operates entirely in the Microsoft Excel environment, some familiarity with this package is helpful. In order to run the model, only ONE file is needed: “CSPM.xls”

This user guide includes details on using the file to create and modify a clinic planning model.

In 2004, Public Health Services of the Montgomery County, Maryland Department of Health and Human Services became one of the first eleven public health agencies in the nation to be recognized as Public Health Ready by the National Association of County and City Health Officials (NACCHO) and the Centers for Disease Control and Prevention (CDC) of the U.S. Department of Health and Human Services. The county is home to one of eight Advanced Practice Centers (APCs) for Public Health Preparedness funded by NACCHO through the CDC.

Important Terms

1. Cycle Time – the average time that a patient spends at a station. The total cycle time is the total time a patient is expected to be in the clinic.
2. Process Time (Service Time, t_o) – the average time that a staff member is in contact with a patient at a station.
3. Routing Probability – the probability that a patient at one station will visit that station when they leave. Example: If five percent of patients who leave Reception go to Sick Bay, and the remaining ninety-five percent go to Education then the routing probability from Reception to Sick Bay equals 0.05, and the routing probability from Reception to Education is 0.95.
4. Work in Process (WIP) – the average number of people at a station. This includes patients waiting and patients being serviced.

Creating a Clinic Planning Model

Preparation

Before beginning to build the clinic planning model, it will be helpful to gather all the information that will be used, as well as planning out the overall structure of the clinic. Worksheets are provided in Appendix A to help with this task; complete them before proceeding to the next section. A completed worksheet with the details of our example clinic is included below. Note that the listed stations are numbered so that the associated destinations are all later in the order. Since the model does not allow patients to travel backwards, the stations need to be listed in an order that permits the desired routings. Look at the sample model for an example of how the table should be used. By doing this, we ensure that we can easily fill in the appropriate probabilities for patient movement on the second sheet. Note that Appendix A contains two versions of the second worksheet: one with dashed lines for black and white printing, and one with colored lines.

Clinic Planning Model Generator

Clinic Planning Worksheet

This worksheet is designed to help you prepare to use the Clinic Model Generator tool. The series of questions below will guide you in gathering the necessary information to build a clinic model.

Demand data

What is the size of the population to be treated in the clinics? 50,000

How many days have been allotted for treatment? 10

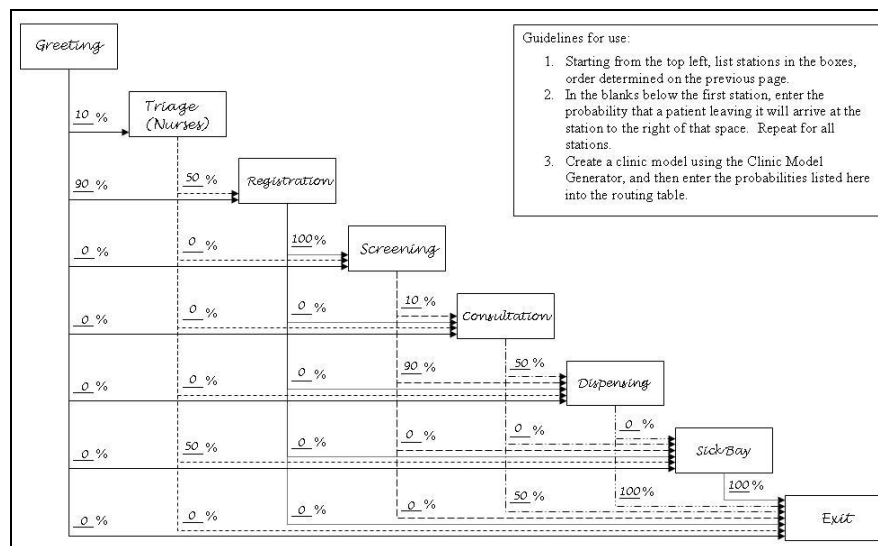
How many hours will the clinics be open each day? 16 (2 shifts)

How many clinic sites will be opened for treatment? 10

Station data

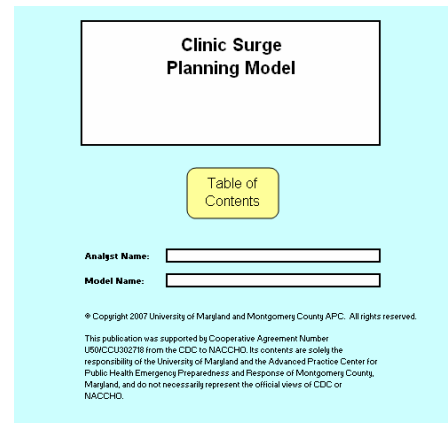
In the 'Station Name' column of the table below, list all stations that patients might visit as they pass through the clinic. In the 'Possible destinations' column, make a note of the stations that patients might visit after that station. Since the model only allows for forward travel, the stations need to be listed in an order that permits the desired routings. Use the column labeled '#' to note the correct order for the stations; look at the sample model for an example of how the table should be used.

Station Name	Possible destinations	#
Greeting	Triage, Registration	1
Triage (Nurses)	Registration, Sick Bay	2
Sick Bay	Exit	7
Screening	Consultation, Dispensing	4
Consultation	Dispensing, Exit	5
Dispensing	Exit	6
Registration	Screening	3



Clinic Setup

Step 1: Open the CSPM.xls file (If a Security Warning appears, select 'Enable macros'; they are required for this software to function correctly). The splash page (right) will appear. Enter your name and a name for the model. (Note that this is not the file name.) Click on the yellow "Table of Contents" box. The Table of Contents tab will appear.



The splash page for the Clinic Surge Planning Model. It features a title box at the top, a yellow "Table of Contents" button, and input fields for "Analyst Name" and "Model Name". At the bottom, there is a copyright notice for 2007 University of Maryland and Montgomery County APC.

Clinic Surge Planning Model

Table of Contents

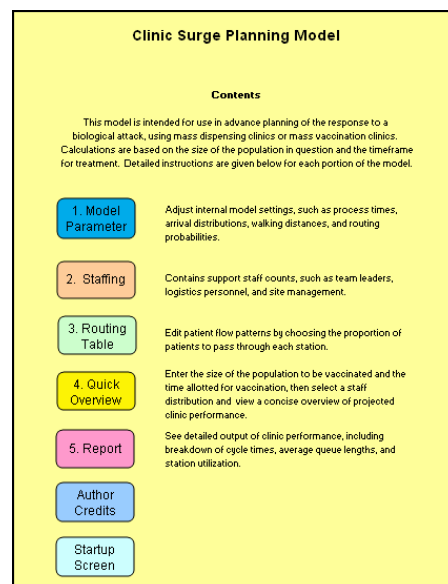
Analyst Name:

Model Name:

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From the Table of Contents tab (right), click on the blue "Model Parameters" box. The Model Parameters tab will appear.



The Table of Contents page for the Clinic Surge Planning Model. It includes a title, a brief description of the model's purpose, and a list of seven menu items with descriptions: 1. Model Parameter, 2. Staffing, 3. Routing Table, 4. Quick Overview, 5. Report, Author Credits, and Startup Screen.

Clinic Surge Planning Model

Contents

This model is intended for use in advance planning of the response to a biological attack, using mass dispensing clinics or mass vaccination clinics. Calculations are based on the size of the population in question and the timeframe for treatment. Detailed instructions are given below for each portion of the model.

1. Model Parameter	Adjust internal model settings, such as process times, arrival distributions, walking distances, and routing probabilities.
2. Staffing	Contains support staff counts, such as team leaders, logistics personnel, and site management.
3. Routing Table	Edit patient flow patterns by choosing the proportion of patients to pass through each station.
4. Quick Overview	Enter the size of the population to be vaccinated and the time allotted for vaccination, then select a staff distribution and view a concise overview of projected clinic performance.
5. Report	See detailed output of clinic performance, including breakdown of cycle times, average queue lengths, and station utilization.
Author Credits	
Startup Screen	

Step 2: On the Model Parameters tab, select the stations required for your clinic. For each station, select the corresponding parameter set from the pull-down list for the “Parameter Set” field. The complete list of processing time values is given in this user’s guide. When you select a parameter set, the corresponding processing time and process batch size will appear in the fields on the right-hand side. If you choose the “00: User-defined” parameter set, then enter the processing time and process batch size for that station. Enter a “0” process batch size for a self-service station.

You can use the same parameter set more than once. For instance, if you have two separate paths for patients, both of which include a registration or dispensing station.

If the clinic has less than eight (8) stations, the last, unused stations should have the “19: No Station” parameter set.

Enter a descriptive name for each station.

Proceed to the Staffing tab by clicking on the orange “Staffing” box at the top of the page. The Staffing tab will appear.

Station Name	Parameter Set (select from list)	Processing Time (min)	Process Batch Size (0 for self-service)
a	00: Registration	1.054	1
b	00: User-defined	1.403	1
	01: No Station	0	0
	02: No Station	0	0
	03: No Station	0	0
	04: No Station	0	0
	05: No Station	0	0
	06: No Station	0	0
	07: No Station	0	0
	08: No Station	0	0

Step 3: The Staffing tab starts as a blank list. This tab allows you to enter staff that support but do not perform the operations at the stations. This includes the clinic command staff, station supervisors, and other assistants.

The Staffing tab can be used to keep track of staffing in the clinic. However, it does not affect the clinic performance estimates.

On each blank line, enter the position title and the number of people in that role.

Then, click on the green “Routing Table” tab at the top of the page. The Routing Table tab will appear.

Staff	Count
Site Director	1
Logistics Chief	1
Logistics Assistants	3
Operations Chief	1
Line Directors	2
Reception Supervisor	1
Dispensing Supervisor	1
	0
	0
	0
	0
	0
	0
	0
Total	10

Step 4: Be sure to save the workbook. You may wish to save the file using a new file name to distinguish it from the blank model that was provided.

Step 5: The Routing Table is used to determine the paths that patients will take through the clinic. For example, in a disease outbreak situation, some small percentage of patients will be identified as symptomatic, and routed away from the main clinic path.

The table lists departure stations across the top, and arrival stations down the right side. The cells denote the percentage of patients departing from a station that will arrive at another station; a probability of 0% indicates that patients cannot make that particular trip. The default routing is that every patient will visit each and every station in sequence. You can modify this table to include alternative routings. The cells in the upper right corner of the table are shaded grey because the model does not allow patients to move backwards through the clinic.

From	From Get Forms	From Complete Forms	From Get Medication	From d	From e	From f	From g	From h	
To Complete Forms	100.0%								
To Get Medication	0.0%	95.0%							
To d	0.0%	0.0%	0.0%						
To e	0.0%	0.0%	0.0%	100.0%					
To f	0.0%	0.0%	0.0%	0.0%	100.0%				
To g	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%			
To h	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%		
To Exit	0.0%	5.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In this example, only 95% of patients who complete forms go to the next station to get medication. The rest go directly to the exit. Because it is the last station, all of the patients who leave the medication station go to the exit. Note that the sums in the bottom row are all 100%. If the patients departing from a station aren't all accounted

for, this value will turn red to indicate an error.

Also on the Routing tab is the distance table. Enter the distance (in feet) from each station to any station where patients will go after leaving that station. It is not necessary to specify distances between stations if no patients travel between those stations.

In this example, there are distances between the first two stations and between the last two stations. There are also distances from Complete forms to the Exit and from Get medication to the Exit.

Distance Table (in ft)								
From Get Forms	From Complete Forms	From Get Medication	From d	From e	From f	From g	From h	
20.00								To Complete Forms
0.00	50.00							To Get Medication
0.00	0.00	0.00						To d
0.00	0.00	0.00	0.00					To e
0.00	0.00	0.00	0.00	0.00				To f
0.00	0.00	0.00	0.00	0.00	0.00			To g
0.00	0.00	0.00	0.00	0.00	0.00	0.00		To h
0.00	20.00	35.00	0.00	0.00	0.00	0.00	0.00	To Exit

Click on the “Quick Overview” box at the top of the page. The Quick Overview tab will appear.

Step
6:

On the Quick Overview tab, enter the following information in the upper-left hand box:

Total number of patients

Time accepting new patients

Number of patients initially waiting

Then, enter the number of operations staff per shift at each station. Self-service stations do not require any staff.

If you haven’t already done so, saved your work.

Default Station Types

The adaptable clinic planning model contains a list of commonly used clinic stations. Each is associated with a processing time mean, which will be added to the clinic model automatically. These times will not describe every possible clinic with perfect accuracy; they depend heavily on various factors, such as the familiarity clinic workers have with their jobs, the length of forms which must be filled by patients, and the type of medication being dispensed or vaccination being applied. The pre-defined parameters for each process can be modified if data is available describing the specific type of operation in question; otherwise, the default values will serve as guidelines.

The table below lists the included stations and the processes they are intended to model. Many of the stations listed have overlapping functions, appropriate for various types of clinic; only the ones appropriate for modeling your particular clinic should be used.

Parameter Set (Processing time mean, process batch size)	Description
<i>Arrival Stations</i>	
01: Reception (1.237, 1)	Patients arrive at this station with a set of forms filled out at a Pre-POD; their answers are checked and then they are sent to the appropriate subsequent station.
02: Registration (1.154, 1)	Patients receive forms and instructions on filling them out.
03: Triage (Greeting) (0.259, 1)	Patients are greeted as they arrive at the clinic; those identified as needing special care (special needs populations), contact with an infectious agent, or showing symptoms of an illness are diverted to the appropriate stations.
04: Triage (Nurses) (1.752, 1)	Patients flagged as showing potential symptoms are examined and either return to the main patient path or receive appropriate treatment.
<i>Main Flow Stations</i>	
05: Dispensing (Multi) (1.34, 1)	This station has several medications available, and usually follows consultation for patients who cannot take the standard medication.
06: Dispensing (Single) (1.051, 1)	This station dispenses the same medication to every patient.
07: Education (Classroom) (24, 30)	Patients are shown an educational video for purposes of informed consent; this station includes an added parameter defining the number of seats in each classroom.
08: Education (Individual) (1.304, 1)	Patients who have questions can be directed to this station to receive further information.

09: Flu Vaccination (Adult) (1.525, 1)	The times for this station are based on observations of a nurse vaccinating only individual, healthy adults (rather than children or family groups).
10: Flu Vaccination (All ages) (2.2306, 1)	The times for this station are based on the combined observations of the two previous groups and can be used for stations where families with children are not treated separately.
11: Flu Vaccination (Child) (3.1944, 1)	The times for this station are based on observations of a nurse vaccinating only children and their parents.
12: Medical consultation (3.765, 1)	Patients with possible complications have an interview with an expert to determine whether they should be treated, and how.
13: Medical screening (1.752, 1)	Patients' forms are examined to make sure they can safely receive the treatment in question; those with potential complications are referred to an expert for a consultation.
14: Vaccination (3.26, 1)	The times for this station are based on a vaccine that requires three separate injections.
<i>Patient Care Stations</i>	
15: Contact (3.8, 1)	Patients who know they have been in contact with the agent being treated for are held for medical examination, after which they are allowed to re-enter the main clinic flow, or sent to a primary care facility.
16: Mental Health (10, 1)	Patients who become overly anxious or disruptive can be brought here to receive care from mental health professionals or crisis counselors.
17: Sick Bay (12.698, 1)	Patients who develop symptoms after passing the initial triage area are sent here for medical examination, after which they are allowed to re-enter the main clinic flow, or sent to a primary care facility.
18: Symptoms (1.213, 1)	Patients showing symptoms consistent with the disease being treated are brought to a holding room for medical examination, after which they are allowed to re-enter the main clinic flow, or sent to a primary care facility.

Working with a Clinic Planning Model

Clinic Planning Model Pages: Startup Screen

When the clinic planning model is created or opened, the startup screen appears. You may enter your name and a descriptive name of your model (note that this is not the file name). This will appear on the report page. To continue, click on the link to the table of contents.

Clinic Planning Model Pages: Table of Contents

The table of contents contains links to different pages in the model.

Below is a list of the entries in the table of contents; more detailed explanations of each page follow. The same navigation buttons are used throughout the model.

Model Parameters	The Model Parameters page contains values that govern station operations, including arrival type and average process time.
Staffing	The Quick Overview portion of the model allows you to dynamically configure the service staff at each station, but many other personnel are required for the operation of a clinic. The Staffing page tallies the support staff to provide an accurate estimate of total clinic staff. Security personnel are not included in the staffing estimate.
Routing Table	The routing table on this page is used to set the percentage of people who visit each station. A distance table is also included, which is used to calculate the time patients spend walking from one station to another.
Quick Overview	This page is the most important part of the interface, where demand and staffing values are set, and where the resulting clinic statistics can be seen.
Report	This page gives a simple, printable summary of the clinic's performance, including graphs comparing the performance of individual stations.
Author Credits	The Author Credits names the main authors of the Clinic Surge Planning Model Generator program, along with several significant contributors
Startup Screen	The Startup Screen button returns the user to the initial screen of the model, which gives the clinic's name and creator.

Clinic Model Pages: Model Parameters

The Model Parameters page contains data describing patient arrivals to the clinic and operations at each station.

- Average walk speed: this walking speed is used to calculate the time patients spend walking from one station to the next. The default value is based on previous studies of pedestrian behavior.
- Station processing time: this is the average time required to complete a station process. Default values come from data recorded at mass vaccination and dispensing exercises.
- Process batch size: the number of patients who go through the process together. For example, an education station that uses classroom may have 30 patients going through the process at the same time. A process batch size of 0 indicates a self-service station.

Table of Contents	Model Parameters	Staffing	Routing Table	Quick Overview	Report
-------------------	------------------	----------	---------------	----------------	--------

Calculation Factor:

Avg walking speed (feet/sec):

Instructions for Station Parameters:

To use predefined parameters, select the parameter set from the pull-down list. (The parameter sets are described in the user's guide.)

To enter your own values, select "00: User-defined" and then enter values to the lower right.

Station Name	Parameter Set (select from list)	Processing Time (min)	Process Batch Size (0 for self-service)
a	02: Registration	1:154	1
b	00: User-defined		
	Enter values:	<input type="text" value="1463"/>	<input type="text" value="1"/>
	19: No Station	0	0
	19: No Station	0	0
	19: No Station	0	0
	19: No Station	0	0
	19: No Station	0	0
	19: No Station	0	0
	19: No Station	0	0

Clinic Model Pages: Staffing

Staffing	Routing Table	Quick Overview																																		
<table border="1"><thead><tr><th></th><th>Staff</th></tr></thead><tbody><tr><td>Site Director</td><td>1</td></tr><tr><td>Logistics Chief</td><td>1</td></tr><tr><td>Logistics Assistants</td><td>3</td></tr><tr><td>Operations Chief</td><td>1</td></tr><tr><td>Line Directors</td><td>2</td></tr><tr><td>Reception Supervisor</td><td>1</td></tr><tr><td>Dispensing Supervisor</td><td>1</td></tr><tr><td></td><td>0</td></tr><tr><td></td><td>0</td></tr><tr><td></td><td>0</td></tr><tr><td></td><td>0</td></tr><tr><td></td><td>0</td></tr><tr><td></td><td>0</td></tr><tr><td></td><td>0</td></tr><tr><td></td><td>0</td></tr><tr><td>Total</td><td>10</td></tr></tbody></table>				Staff	Site Director	1	Logistics Chief	1	Logistics Assistants	3	Operations Chief	1	Line Directors	2	Reception Supervisor	1	Dispensing Supervisor	1		0		0		0		0		0		0		0		0	Total	10
	Staff																																			
Site Director	1																																			
Logistics Chief	1																																			
Logistics Assistants	3																																			
Operations Chief	1																																			
Line Directors	2																																			
Reception Supervisor	1																																			
Dispensing Supervisor	1																																			
	0																																			
	0																																			
	0																																			
	0																																			
	0																																			
	0																																			
	0																																			
	0																																			
Total	10																																			

This page allows the model to estimate the various support staff required to run a clinic. The titles and numbers for each support position, highlighted with green borders, can be adjusted by the user, but service staff at each station can only be changed on the Quick Overview page. The total of the staff specified here is the number seen at the bottom of the Quick Overview page and used to calculate staffing across all clinics. The staffs listed here do not affect clinic capacity or queuing.

Clinic Model Pages: Routing Table

The Routing Table is used to describe the paths that patients will take through the clinic. For example, in a disease outbreak situation, some small percentage of patients will be identified as symptomatic, and routed away from the main clinic path. The default routing specified at model creation is linear; all patients move through every station in the clinic in order. This should be modified by the user if the patient paths are less straightforward. The cells in the upper right corner of the table are shaded grey because the model does not allow patients to move backwards through the clinic.

Note: if the number of stations in the model makes it difficult to see everything at once, you can zoom out to view more of the table. Alternatively, you can select the first of the 'To' stations on the right and click on 'Window – Split'. This will allow you to scroll the main part of the table while the top and right labels remain visible.

Routing Probabilities							
From Greeters	From Triage (Nurses)	From Registration	From Medical screening	From Medical consultation	From Dispensing (Multi)	From Sick Bay	
10.0%							To Triage (Nurses)
90.0%	50.0%						To Registration
0.0%	0.0%	100.0%					To Medical screening
0.0%	0.0%	0.0%	10.0%				To Medical consultation
0.0%	0.0%	0.0%	90.0%	50.0%			To Dispensing (Multi)
0.0%	50.0%	0.0%	0.0%	0.0%	0.0%		To Sick Bay
0.0%	0.0%	0.0%	0.0%	50.0%	100.0%	100.0%	To Exit
100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	Sum
Sum should be 100%							

The table lists departure stations across the top, and arrival stations down the right side. The cells denote the percentage of patients departing from a station that will arrive at another station; a probability of 0% indicates that patients cannot make that particular trip. For instance, using the values shown above, upon leaving the Greeter station, 10% of patients will be sent to Triage (Nurses), while the rest will proceed to Registration.

Note that the sums in the bottom row are all 100%. If the patients departing from a station aren't all accounted for, this value will turn red to indicate an error.

Distance Table (in ft)							
From Greeters	From Triage (Nurses)	From Registration	From Medical screening	From Medical consultation	From Dispensing (Multi)	From Sick Bay	
0.00							To Triage (Nurses)
0.00	0.00						To Registration
0.00	0.00	0.00					To Medical screening
0.00	0.00	0.00	0.00				To Medical consultation
0.00	0.00	0.00	0.00	0.00			To Dispensing (Multi)
0.00	0.00	0.00	0.00	0.00	0.00		To Sick Bay
0.00	0.00	0.00	0.00	0.00	0.00	0.00	To Exit

The Distance Table on the same page works similarly. Here, the distance from each station to the next is specified, in order to incorporate walking times into the model. By default, all distances are zero, so that walking time is ignored. When assigning distances, it is only necessary to fill in values for possible combinations. For instance, in the previous example, no patients go from registration to the exit, so there is no need to assign a distance to this route.

Clinic Model Pages: Quick Overview

The Quick Overview page of the clinic planning model contains a lot of information, so let's go through each part of it in detail.

Upper Left Corner: Input Demand

After you create a model with the generator program, the numbers you input for the population demands and clinic operations will appear here. To investigate alternative scenarios, such as the effect of changing the number of hours the clinic is accepting new patients, the initial number of patients waiting, or the number of patients the clinic plans to serve during the whole day, change the values in the green-edged boxes.

Table of Contents	Model Parameter	Staffing	Routing Table
Inputs			
Demand			
Total number of patients (including initial waiting):	<input type="text" value="1000"/>		
Time accepting new patients (hours):	<input type="text" value="4"/>		
Number of patients initially waiting:	<input type="text" value="150"/>		

Lower Left Corner: Input Staffing

The staffing is initially zero for each station. You can set the staffing at each station by typing how many personnel you desire in each green-edged boxes.

Note that self-service stations require no staff, since the patients perform the process by themselves. (Helpers or supervisors should be entered in the Staffing tab.)

It is often useful to add more staff to a station that is not performing as well as it might. As in the input demand area, green-edged boxes indicate a user-input value.

Station service staff are totaled below each column; below that, the total staff, including team leaders and administrators (see Staffing page), is given.

Staffing	
Station Name	Staff per shift
Registration	<input type="text" value="6"/>
Symptoms	<input type="text" value="6"/>
Education Classroom	<input type="text" value="3"/>
Vaccination	<input type="text" value="9"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
Total Service Staff	<input type="text" value="24"/>
Total Staff	<input type="text" value="24"/>

Upper Right Corner: General Performance

This area gives overall performance measures for the clinic; all of these values are calculated dynamically, and will update automatically when you change any input value.

- Time needed to serve all patients: the time it takes to serve all the patients. This will always be longer than the inputted accepting time.
- Service rate: This is how many patients can be served in hour. This is equivalent to the service rate at the station that performs the slowest.
- Average number of patients: This is the calculated average number of patients in the clinic that are being serviced during the whole time the clinic is open.
- Average time in clinic: This is the estimated time that one patient will spend in the clinic assuming there is no waiting.
- Total staff per shift across all clinics: This total number of staff includes support and service staff for each clinic in the model, but does not take into account incident command staff.

Outputs	
General Performance	
Time needed to serve all patients (hours):	6.42
Service rate (patients/hour):	168
Average number of patients in clinic:	272
Average time in clinic (minutes):	105
Total staff per shift across all clinics:	24

Lower Right Corner: Station-level Results

This part of the page gives more detailed information about individual stations, including bottleneck (the slowest performing station) and relative capacity (the service rate at each individual station).

The output for these functions is very simple. If the particular station is the bottleneck in the system, a “Yes” will appear. The relative capacity appears for each station in patients per hour.

Individual Station Performance		
Station Name	Bottleneck?	Relative Capacity (patients/hour)
Registration	NO	312
Symptoms	NO	1979
Education Classroom	NO	228
Vaccination	YES	168
	NO	
	NO	
	NO	
	NO	

Clinic Model Pages: Report

A printable summary of the clinic can be found on the Report page. It lists the clinic demand information, along with the overall clinic performance data.

Table of Contents	Model Parameters	Staffing	Routing Table	Quick Overview	Report
Analyst Name:		0	7/28/2007		
Model Name:		0			
Total number of patients (including initial waiting):		1000	Time needed to serve all patients (hours):		6.42
			Service rate (patients/hour):		168
Time Accepting new patients (hours):		4	Average number of patients in clinic:		272
			Average time in clinic (minutes):		105
Number of patients initially waiting:		150	Total staff per shift across all clinics:		24

Additional Information

For information about how the model calculates its results, see the report “The Clinic Surge Planning Model: Performance Estimates and Validation Results,” by Adam Montjoy and Jeffrey Herrmann.

If you have questions or suggestions, please contact Jeffrey Herrmann at the following address:

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Appendix A:

Clinic Planning Worksheets

Clinic Planning Worksheet

This worksheet is designed to help you prepare to use the Clinic Model Generator tool. The series of questions below will guide you in gathering the necessary information to build a clinic model.

Demand data

What is the size of the population to be treated in the clinics? _____

What is the initial population waiting? _____

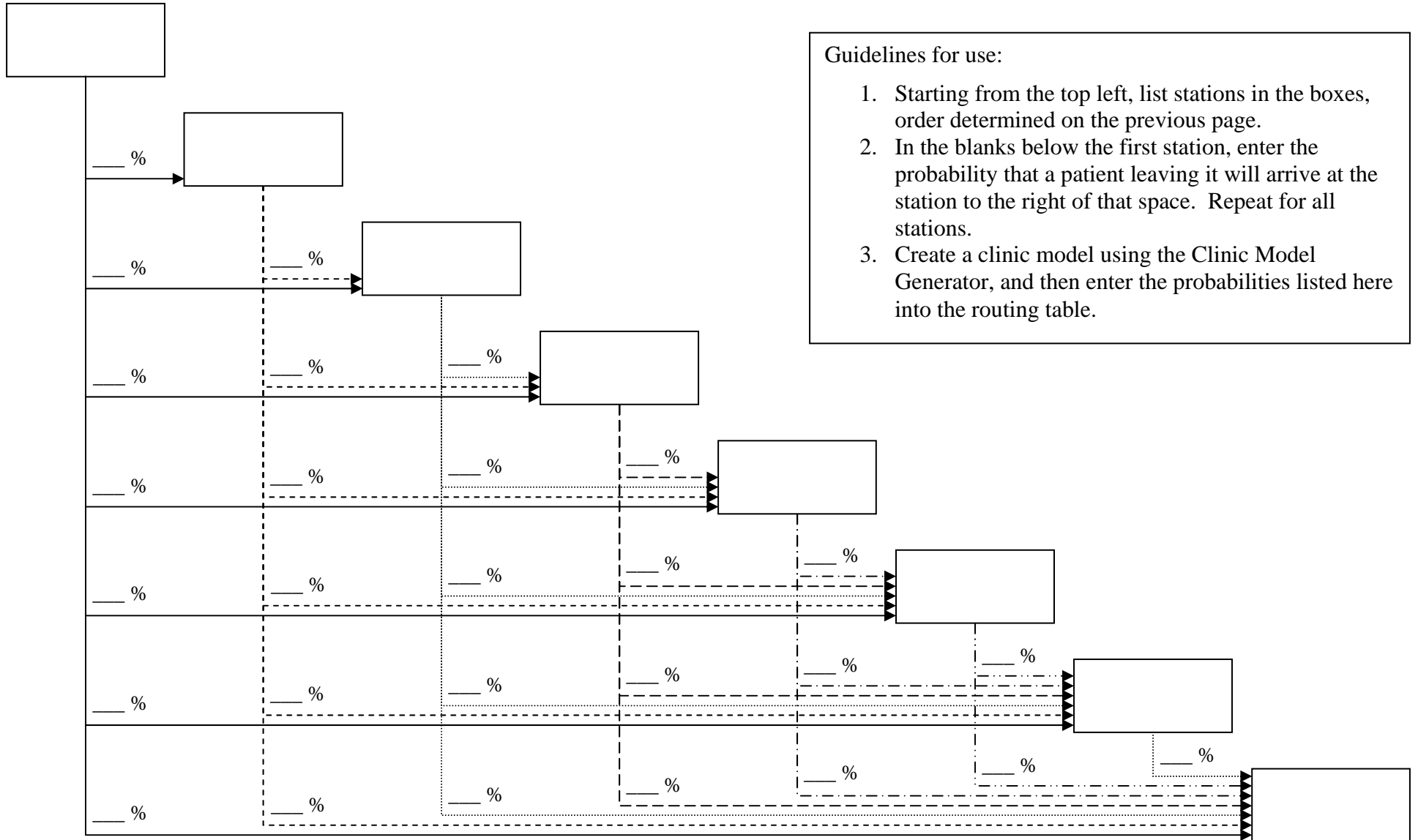
How many hours will the clinic accept new patients? _____

Station data

In the ‘Station Name’ column of the table below, list all stations that patients might visit as they pass through the clinic. In the ‘Possible destinations’ column, make a note of the stations that patients might visit after that station. Since the model only allows for forward travel, the stations need to be listed in an order that permits the desired routings. Use the column labeled ‘#’ to note the correct order for the stations; look at the sample model for an example of how the table should be used.

Station Name	Possible destinations	#

Clinic Routing Worksheet



The diagram illustrates a clinic routing process. It begins with a starting box at the top left. A vertical line descends from this box, with a horizontal arrow pointing to the right to a second box, labeled with a blank percentage field. From the second box, a vertical dashed line descends, and a horizontal dashed arrow points to the right to a third box, also labeled with a blank percentage field. This pattern continues: a vertical solid line descends from each box, and a horizontal dashed arrow points to the right to the next box in the sequence. Each of these horizontal transitions is labeled with a blank percentage field. The sequence consists of seven boxes in total, arranged in a descending staircase pattern from top-left to bottom-right. The final box at the bottom right has a horizontal dashed arrow pointing to the right, which terminates in a series of five small black triangles, indicating the end of the routing process.

Guidelines for use:

1. Starting from the top left, list stations in the boxes, order determined on the previous page.
2. In the blanks below the first station, enter the probability that a patient leaving it will arrive at the station to the right of that space. Repeat for all stations.
3. Create a clinic model using the Clinic Model Generator, and then enter the probabilities listed here into the routing table.

Clinic Routing Worksheet

