Pandemic Influenza Vaccine Campaign Planning Tool - *User's Manual*

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Centers for Disease Control and Prevention

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INTRODUCTION

What does this tool do?

This tool was created to help public health programs (i.e. “the users”) compare various pandemic influenza vaccine provider participation rates and vaccine administration capacity scenarios in terms of the estimated number of weeks it may take to vaccinate a target population.

The results are based on a number of assumptions and user defined inputs, including the size of the target population, the proportion of children and adults in the target population, the type and number of vaccine providers or settings participating in the pandemic vaccination campaign (e.g., the number of chain pharmacies, large outpatient clinics, small outpatient clinics, temporary mass vaccination clinics or Points of Dispensing, etc.), and estimated weekly vaccine administration capacity by provider or setting. Users can also factor in available vaccine supply and consider how changes to supply over time may impact results (i.e. vaccine available now vs. supply over weeks, months).

In this tool, the doses of vaccine are allocated to each provider group based on the percent of the overall target population the user expects to be vaccinated by each provider group. If the percent of the target population vaccinated by each provider group changes over time, allocation to each provider is also adjusted. After a user has entered all inputs, the results may inform the user if they have over or under-allocated pandemic vaccine to certain vaccine provider groups based on weekly vaccine administration capacity.

Results from this tool should be used for discussion purposes among the user’s pandemic influenza planning partners in immunization programs, public health preparedness programs, and other private sector groups to plan and improve the efficiency of the jurisdiction’s vaccine provider outreach, recruitment, and readiness efforts.

What does this tool not do?

The tool is not designed to optimize provider allocation strategies for the user. In other words, the tool will not tell the user how to allocate pandemic vaccine doses to each provider.

However, by working through the tool, users will likely come to their own conclusions about the best approach to allocating vaccine to participating vaccine providers in their jurisdiction. This tool is also not designed to assess staffing at each vaccination setting or public demand for vaccinations.

Who the tool is designed for?

The intended users of this tool are federal, state, and local level public health preparedness officials involved in pandemic vaccine provider outreach.

System requirements

The Pandemic Influenza Vaccine Campaign Planning Tool uses the Windows* operating system (Excel Microsoft Office 2000 or higher).

*Microsoft Windows and Office are copyrighted products produced by Microsoft Corporation, WA. The use of trade named products is for information purposes only. The U.S. Federal Government or its agencies do not endorse any specific computer or operating system.

HOW THE TOOL WORKS

Estimation

The tool calculates the number of weeks required to vaccinate a number of individuals, given user defined input parameters. It aggregates the total number of doses administered by different providers to adults and children. Each provider's weekly administered vaccines are based on the number of doses allocated to each provider by the user and the provider's estimated throughput [1]. Patients will likely require two doses of pandemic influenza vaccine received 21 days apart. The tool does not track whether a certain provider is providing dose one vs dose two of the vaccination series. To calculate vaccination coverage, the tool considers that the total number of individuals vaccinated corresponds to half of all doses administered (after the required vaccination lag between doses).

Assumptions

The estimation strategy makes the following assumptions:

- Public demand for vaccination is high as the tool assumes severe influenza pandemic conditions (i.e., everyone targeted for vaccination will want to get vaccinated once vaccine is available);
- Two vaccine doses are required for each person in the target population;
- The tool estimates the total number of doses of vaccine administered. Since two doses are needed for each person, the total number of people fully vaccinated is assumed to be equal to the number of doses administered divided by two;
- Weekly vaccine administration capacity or rate for each provider type or setting is the same every week once defined by the user.

ENTERING THE INPUT PARAMETERS

The following inputs are necessary:

- *Characteristics of the vaccination campaign*
  - Total number of persons targeted for vaccination in a jurisdiction (NOTE: for a pandemic vaccination campaign across the jurisdiction, the target population will likely be the total number of persons in the jurisdiction);
  - Percent of children in the target population;
  - A vaccination coverage goal for the target population (80% is the suggested two-dose pandemic vaccination coverage goal for a severe influenza pandemic).

- *Vaccine provider characteristics*
  - Determine provider group(s) - Description or label for each type of pandemic vaccine provider type or setting participating in the campaign (e.g., chain pharmacy, independent pharmacy, hospital, school-located vaccination clinic, small outpatient clinic, large outpatient clinic, mass vaccination clinics or Points of Dispensing, etc.);
  - Number of providers or sites for each provider group participating in the pandemic vaccination campaign;
  - Age group of population served by each provider type or setting (e.g., child, adult, or all ages);
  - Weekly vaccine administration capacity or rate for each provider type or setting.

- *Vaccine allocation strategy*
  - Whether pandemic vaccines are available to allocate to providers all at once or only available for allocation each month and whether the amount of vaccine available for allocation changes each month;
  - Proportion of children and adults served by each provider type or setting (e.g., the user can determine that 20% or another percentage of the target population will be vaccinated by chain pharmacies); this proportion should be equal to the proportion of vaccine that will be allocated to each provider type or setting.

PARAMETER CONSISTENCY

Parameters need to be inputted correctly and be internally consistent in order for the tool to estimate the speed of the vaccination campaign.

Checking if all inputs were entered correctly

- The worksheet “Input warning” tells the user if all required inputs were inserted correctly. A suggestion of how to fix possible input errors appears if necessary.

Checking if all inputs are consistent

- The inputs need to be internally consistent for the tool to be able to estimate the speed of the vaccination campaign. That is, the total population to be vaccinated at each provider needs to be inferior to the provider’s capacity, so that there are no unused doses. The tool will warn the user how to correct inputs, if necessary.

MODEL OUTPUTS

Given users' inputs, the tool estimates the characteristics of the vaccination campaign in terms of:

Speed of vaccination campaign

- Number of weeks required to reach the target population coverage, for each scenario

Efficiency of vaccination campaign

- Share of each provider capacity that was utilized

STEP BY STEP USER DEFINED INPUTS

Decision guide

Step 1.) Identify Population Characteristics

Required Inputs:

- ✓ Size of population to be vaccinated
- ✓ Vaccine coverage target
- ✓ Proportion of the population made up of children

Note: These characteristics should remain constant between scenarios

Step 2.) Define Provider Population

Required Inputs:

- ✓ Types of healthcare providers operating in the jurisdiction
  - o Example: PODs/DVCs, Pharmacies, Hospitals, Private Physicians
- ✓ Number of individual providers of each type present in the jurisdiction
- ✓ Age group (Adults, Children, Both) served by each provider type

Step 3.) Define Vaccination Capacity

Required Inputs:

- ✓ Proportion of providers making up each provider type/setting that will be offering pandemic vaccine
- ✓ Calculated provider throughput as [Doses Administered/Week] for each provider type

Step 4.) Define Vaccine Availability

Decision point:

Will all doses of vaccine required to reach the vaccine coverage target (defined in step 1) be available at the start of the vaccination campaign?

If Yes: <Move to Step 6>

If No: Define the proportion of doses of vaccine available for allocation each month as a proportion of the total number of doses required to reach the vaccination coverage target by filling in Table 1, then move to Step 5.

TABLE 1 – DETERMINING PANDEMIC VACCINE AVAILABILITY	
% Vaccine Doses Available in Month 1	
% Vaccine Doses Available in Month 2	
% Vaccine Doses Available in Month 3	
% Vaccine Doses Available in Month 4	
% Vaccine Doses Available in Month 5	
% Vaccine Doses Available in Month 6	

Step 5.) Define Vaccine Allocation

Decision point:

Will the proportion of vaccine allocated to each provider type remain the same during each month throughout the campaign?

If Yes: <Move to Step 6>

If No: Define the proportion of the monthly vaccine allocation administered by each provider type for each month of the campaign by filling in Table 2, then move to Step 6.

- Example:

Provider Type	*Month 1*	*Month 2*	*Month 3*	*Month 4*
POD/DVC	*50%*	*30%*	*10%*	*0%*
Pharmacy	*20%*	*40%*	*60%*	*85%*
Hospital	*20%*	*20%*	*20%*	*10%*
Private Physician	*10%*	*10%*	*10%*	*5%*
Monthly Allocation	*100%*	*100%*	*100%*	*100%*

TABLE 2 - DETERMINING MONTHLY VACCINE ALLOCATION TO PROVIDER TYPES

Provider Type	Month 1	Month 2	Month 3	Month 4	Month 5
Provider 1					
Provider 2					
Provider 3					
Provider 4					
Provider 5					
Provider 6					
Monthly Allocation	*100%*	*100%*	*100%*	*100%*	*100%*

Step 6.) Estimate Vaccine Administration

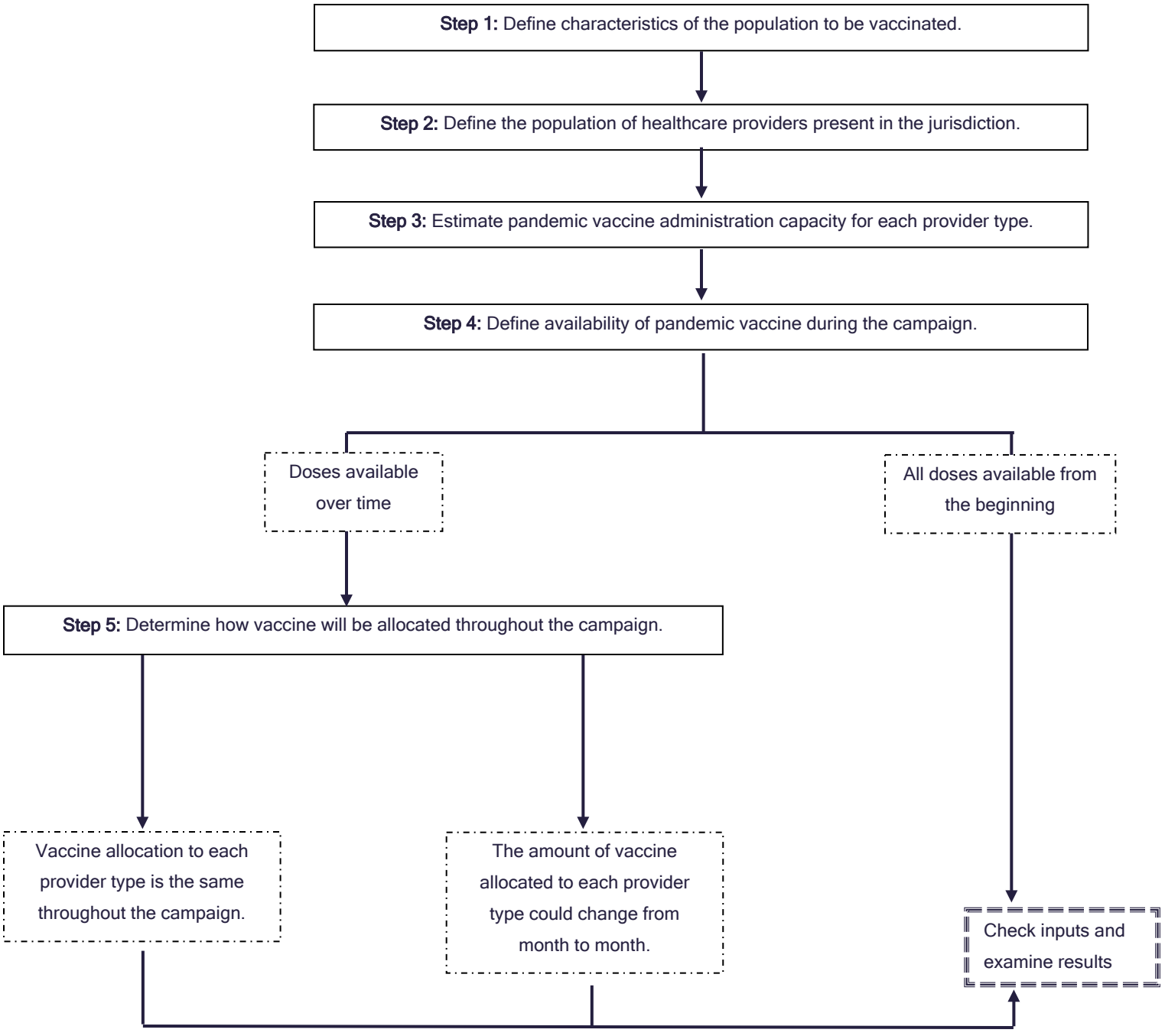
Required Inputs:

- ✓ Proportion of vaccine doses allocated to Provider Type (Table 3)

TABLE 3		
Provider Type	% of vaccine doses allocated to provider for adult vaccine administration	% of vaccine doses allocated to provider for children vaccine administration
Provider 1		
Provider 2		
Provider 3		
Provider 4		
Provider 5		

Schematic of decision steps

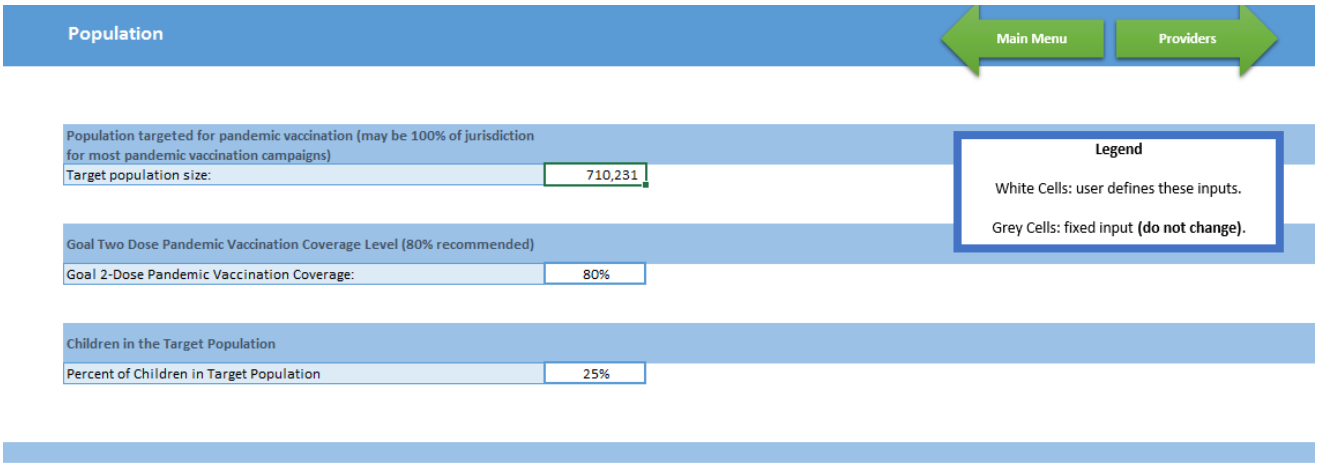
The figure below exemplifies the different steps.



Step by step guide with screenshots

Step 1 – Characterize Population to be Vaccinated

The first page is designed to receive general information about the vaccination campaign.



Step 2 - Define Providers

In the second page, users input information about the number and population served by the providers (adult, children, or both).

Define providers: Name, population served and number of providers

Provider: define name	Age of Population Served	Total Number of Providers	Population group served	
Provider 1	Adult	25000	☑ Adults	☐ Children
Provider 2	Adult	15000	☑ Adults	☐ Children
Provider 3	Adult	18000	☑ Adults	☐ Children
Provider 4	Adult	6000	☑ Adults	☐ Children
Provider 5	Adult	6750	☑ Adults	☐ Children
Provider 6	Adult	11000	☑ Adults	☐ Children
Provider 7	Children	25000	☐ Adults	☑ Children
Provider 8	Children	10700	☐ Adults	☑ Children
Provider 9	All Ages	2000	☑ Adults	☑ Children
Provider 10	All Ages	4100	☑ Adults	☑ Children
Provider 11	All Ages	6000	☑ Adults	☑ Children
Provider 12	All Ages	10000	☑ Adults	☑ Children

Instructions

Fill in White Cells only.

Define the name and number of providers. Specify the population served by the providers (if both, providers will be considered "Joint" providers).

Legend

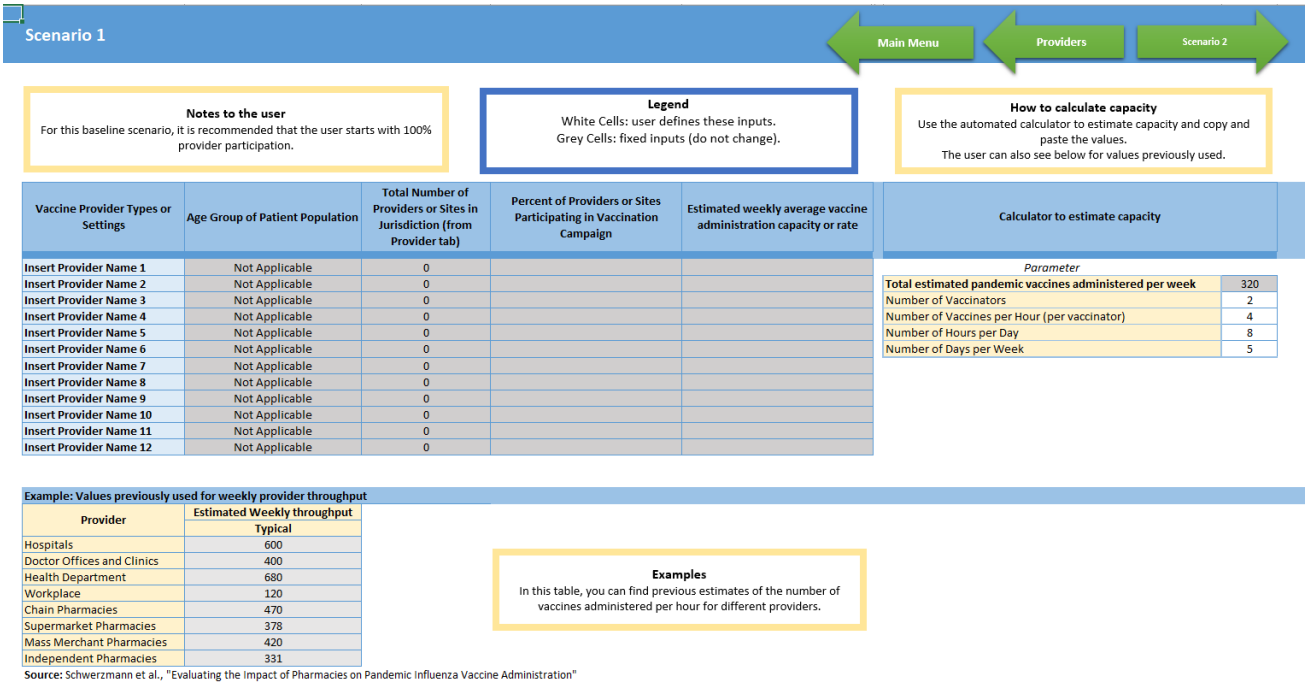
White Cells: user defined input.

Grey Cells: generated input.

Population | Baseline Scenario

Step 3 – Define Provider Participation Scenarios

Users may define up to three different scenarios of provider participation. For each scenario, users may define a different level of provider engagement, provider throughput, and required weeks to reach assumed throughput.



Scenario 1

Main Menu | Providers | Scenario 2

Notes to the user
For this baseline scenario, it is recommended that the user starts with 100% provider participation.

Legend
White Cells: user defines these inputs.
Grey Cells: fixed inputs (do not change).

How to calculate capacity
Use the automated calculator to estimate capacity and copy and paste the values.
The user can also see below for values previously used.

Vaccine Provider Types or Settings	Age Group of Patient Population	Total Number of Providers or Sites in Jurisdiction (from Provider tab)	Percent of Providers or Sites Participating in Vaccination Campaign	Estimated weekly average vaccine administration capacity or rate
Insert Provider Name 1	Not Applicable	0		
Insert Provider Name 2	Not Applicable	0		
Insert Provider Name 3	Not Applicable	0		
Insert Provider Name 4	Not Applicable	0		
Insert Provider Name 5	Not Applicable	0		
Insert Provider Name 6	Not Applicable	0		
Insert Provider Name 7	Not Applicable	0		
Insert Provider Name 8	Not Applicable	0		
Insert Provider Name 9	Not Applicable	0		
Insert Provider Name 10	Not Applicable	0		
Insert Provider Name 11	Not Applicable	0		
Insert Provider Name 12	Not Applicable	0		

Calculator to estimate capacity

Parameter	
Total estimated pandemic vaccines administered per week	320
Number of Vaccinators	2
Number of Vaccines per Hour (per vaccinator)	4
Number of Hours per Day	8
Number of Days per Week	5

Example: Values previously used for weekly provider throughput

Provider	Estimated Weekly throughput
	Typical
Hospitals	600
Doctor Offices and Clinics	400
Health Department	680
Workplace	120
Chain Pharmacies	470
Supermarket Pharmacies	378
Mass Merchant Pharmacies	420
Independent Pharmacies	331

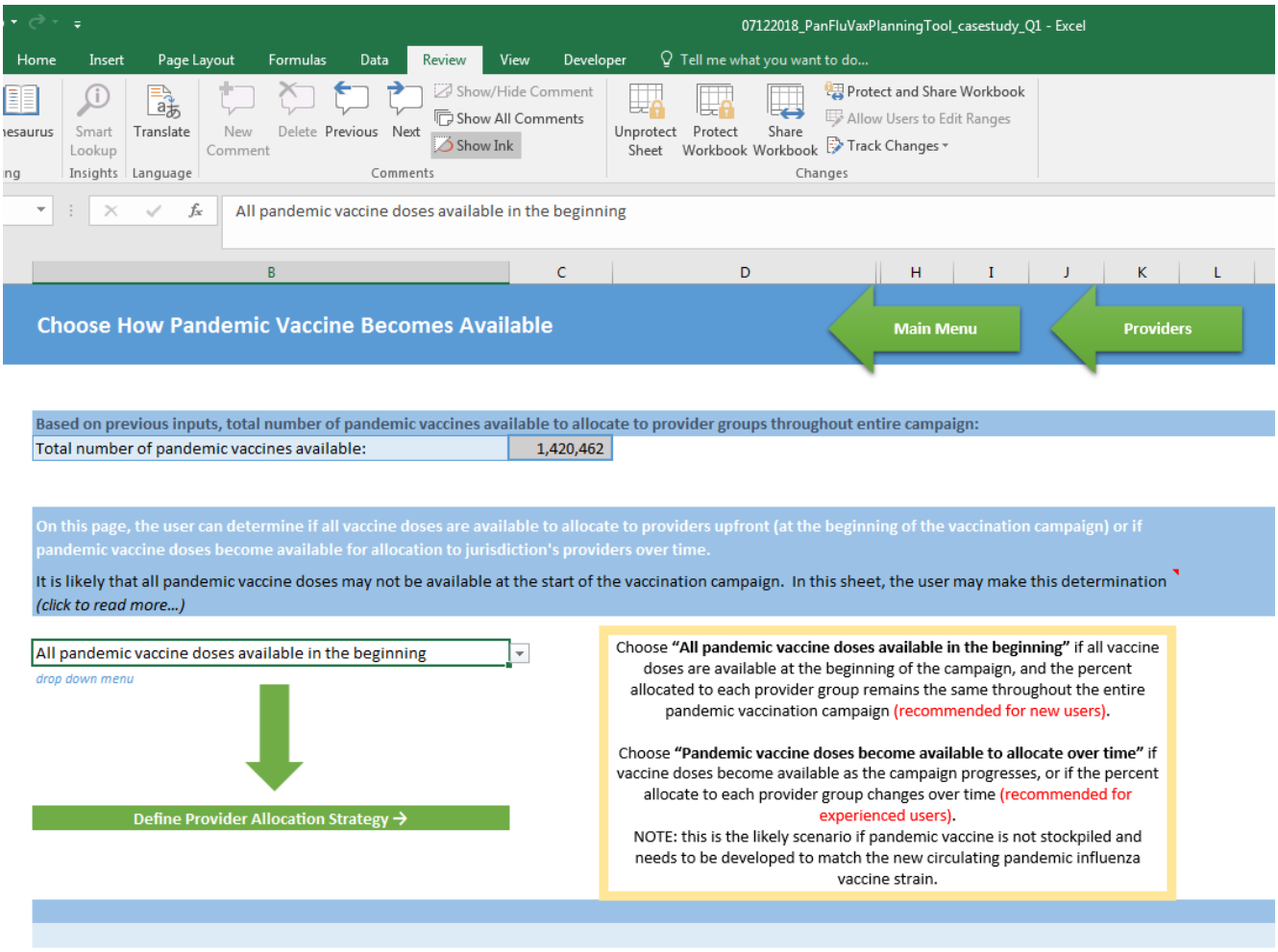
Source: Schwerzmann et al., "Evaluating the Impact of Pharmacies on Pandemic Influenza Vaccine Administration"

Examples
In this table, you can find previous estimates of the number of vaccines administered per hour for different providers.

Step 4 – Define Availability of Vaccine during Campaign

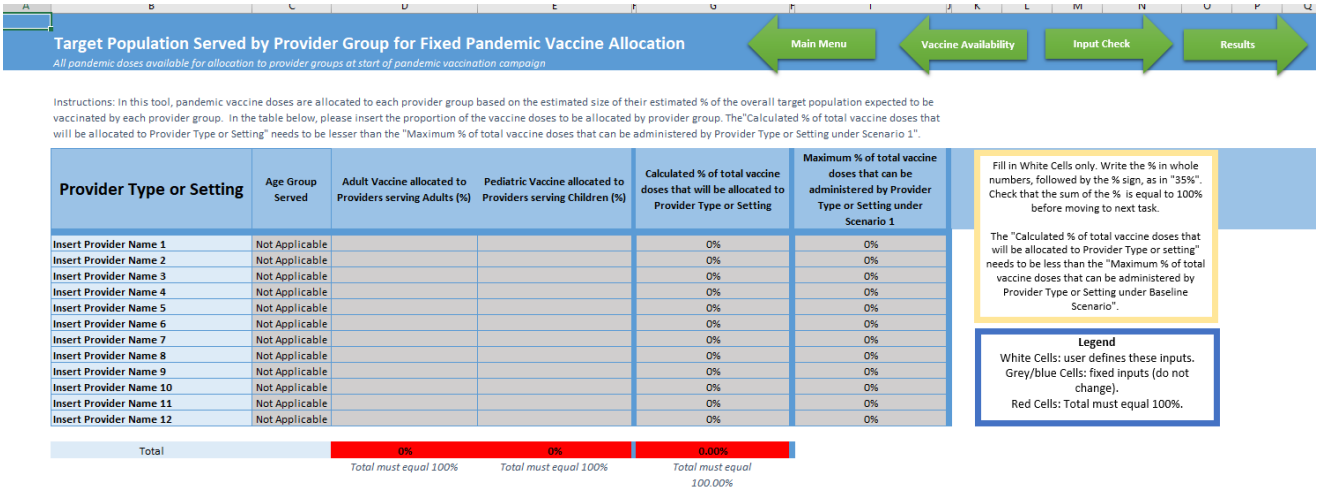
The user will need to select desired allocation method, that is, in what way will vaccines be available:

- **All pandemic vaccine doses available in the beginning:** all vaccine doses are available at the beginning of the campaign, and the percent allocated to each provider group remains the same throughout the entire pandemic vaccination campaign.
- **Pandemic vaccine doses become available to allocate over time:** vaccine doses become available as the campaign progresses (the others will be available as the vaccination campaign develops), or vaccines will be allocated differently among the different providers as the campaign evolves.



Step 5 – Define Vaccine Allocation

The user will then need to define the percent of all doses to be allocated to each provider type. If all vaccine doses are available in the beginning of the vaccination campaign and vaccine dose allocation does not change per month, the user will need to input values as noted below. If the vaccine doses become available as the campaign progresses, then it is necessary to define vaccine availability.



Target Population Served by Provider Group for Fixed Pandemic Vaccine Allocation

All pandemic doses available for allocation to provider groups at start of pandemic vaccination campaign

Main Menu | Vaccine Availability | Input Check | Results

Instructions: In this tool, pandemic vaccine doses are allocated to each provider group based on the estimated size of their estimated % of the overall target population expected to be vaccinated by each provider group. In the table below, please insert the proportion of the vaccine doses to be allocated by provider group. The"Calculated % of total vaccine doses that will be allocated to Provider Type or Setting" needs to be lesser than the "Maximum % of total vaccine doses that can be administered by Provider Type or Setting under Scenario 1".

Provider Type or Setting	Age Group Served	Adult Vaccine allocated to Providers serving Adults (%)	Pediatric Vaccine allocated to Providers serving Children (%)	Calculated % of total vaccine doses that will be allocated to Provider Type or Setting	Maximum % of total vaccine doses that can be administered by Provider Type or Setting under Scenario 1
Insert Provider Name 1	Not Applicable			0%	0%
Insert Provider Name 2	Not Applicable			0%	0%
Insert Provider Name 3	Not Applicable			0%	0%
Insert Provider Name 4	Not Applicable			0%	0%
Insert Provider Name 5	Not Applicable			0%	0%
Insert Provider Name 6	Not Applicable			0%	0%
Insert Provider Name 7	Not Applicable			0%	0%
Insert Provider Name 8	Not Applicable			0%	0%
Insert Provider Name 9	Not Applicable			0%	0%
Insert Provider Name 10	Not Applicable			0%	0%
Insert Provider Name 11	Not Applicable			0%	0%
Insert Provider Name 12	Not Applicable			0%	0%
Total		0%	0%	0.00%	
		Total must equal 100%	*Total must equal 100%*	*Total must equal 100.00%*	

Fill in White Cells only. Write the % in whole numbers, followed by the % sign, as in "35%". Check that the sum of the % is equal to 100% before moving to next task.

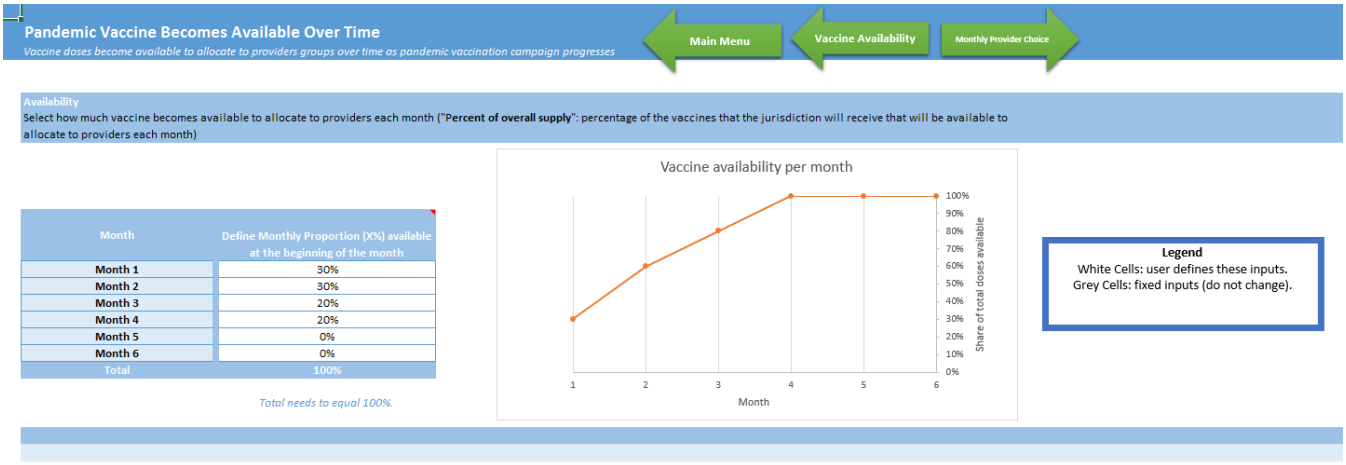
The "Calculated % of total vaccine doses that will be allocated to Provider Type or setting" needs to be less than the "Maximum % of total vaccine doses that can be administered by Provider Type or Setting under Baseline Scenario".

Legend
White Cells: user defines these inputs.
Grey/blue Cells: fixed inputs (do not change).
Red Cells: Total must equal 100%.

Users may only input numbers in the white cells; cells will be colored grey if the provider does not serve a particular type of the population.

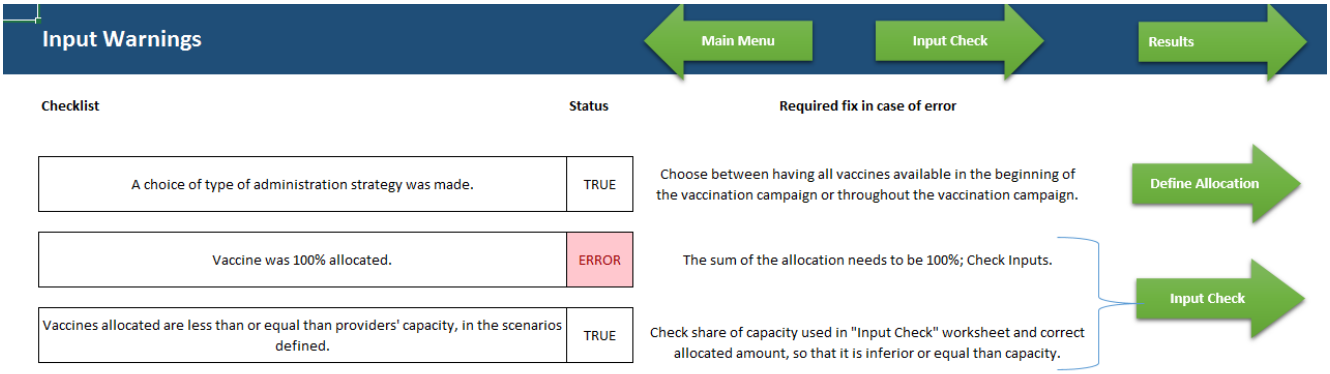
Step 6 – Define Vaccine Availability

When the monthly allocation method is chosen, the user will need to define how many vaccine doses are available at the beginning of each month. After defining how many vaccine doses become available per month, the user will have to define the percent of vaccine doses allocated per provider.



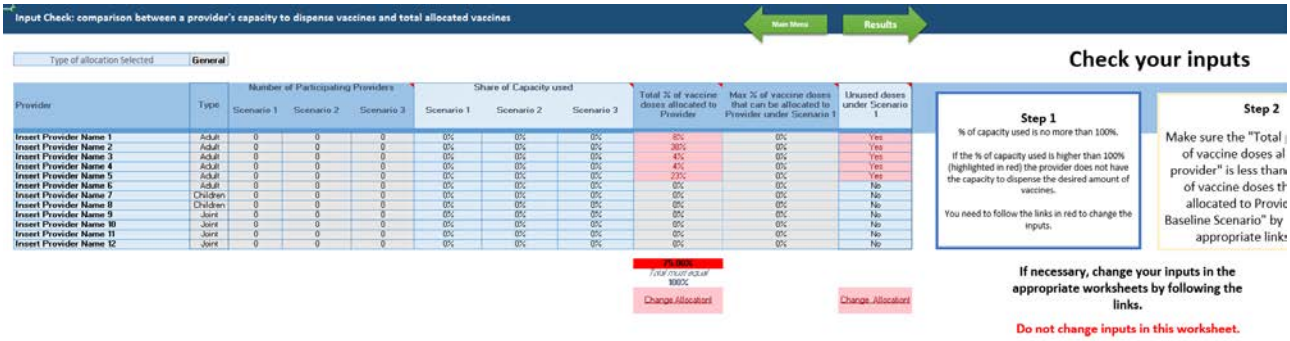
Input Warning

This page will make it clear to the user if all the inputs were correctly inserted in the tool. If some inputs were inserted incorrectly, the tool will suggest ways of correcting the errors.



Input Check

In this page, the tool warns the user if: i) the totals allocated correspond to 100% of the population, and i) whether current planning results in unused doses. Issues that need to be corrected by the user will appear in red.



Results

This page displays the number of weeks required to reach the campaign vaccination target; the percent of each provider capacity used in the campaign, and whether there are unused doses at the end of the vaccination campaign.

Results: speed and efficiency of vaccination campaign

Speed

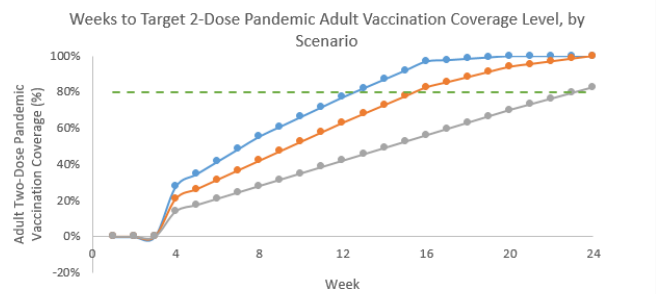
Weeks to reach 80% of adults or children.

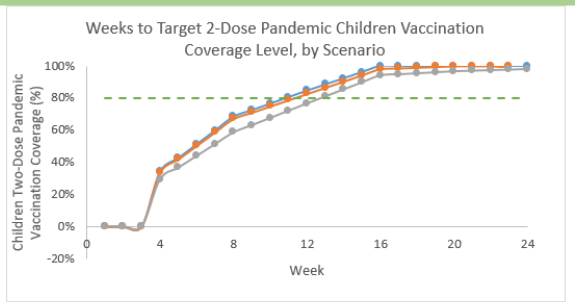
100% Provider Participation		
Population	Adults	Children
Weeks	13	11

75% Provider Participation		
Population	Adults	Children
Weeks	16	12

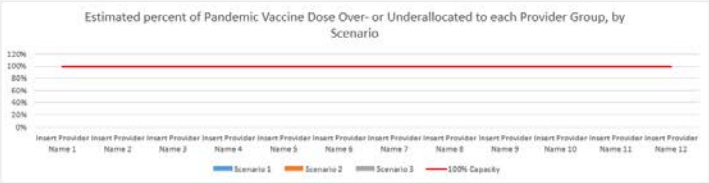
50% Provider Participation		
Population	Adults	Children
Weeks	24	13

Speed: Percent of Adult and Pediatric Target Population Vaccinated per Week





Efficiency: Are pandemic vaccine allocated correctly based on the estimated weekly vaccination administration capacity for each provider? If the proportion of capacity used is above or close to 100% that suggests the provider was overallocated with vaccines. Note the graph on the right to check if there are unused doses.



	Scenarios	Scenario 1	Scenario 2	Scenario 3
Unused doses	Insert Provider Name 1	Undefined	Undefined	Undefined
	Insert Provider Name 2	Undefined	Undefined	Undefined
	Insert Provider Name 3	Undefined	Undefined	Undefined
	Insert Provider Name 4	Undefined	Undefined	Undefined
	Insert Provider Name 5	Undefined	Undefined	Undefined
	Insert Provider Name 6	Undefined	Undefined	Undefined
	Insert Provider Name 7	Undefined	Undefined	Undefined
	Insert Provider Name 8	Undefined	Undefined	Undefined
	Insert Provider Name 9	Undefined	Undefined	Undefined
	Insert Provider Name 10	Undefined	Undefined	Undefined
	Insert Provider Name 11	Undefined	Undefined	Undefined
	Insert Provider Name 12	Undefined	Undefined	Undefined

Auxiliary Pages and Appendix

These pages are shown for informational purposes only. They may not be altered by the users.

FREQUENTLY ASKED QUESTIONS

How to calculate provider capacity?

The user may estimate provider capacity in the worksheet “Calculate capacity.”

I am still unsure about the precise provider inputs. How to proceed?

If the user is unsure on the precise magnitude of the providers’ inputs, the user may calculate the speed and efficiency of a given vaccination campaign using different assumed scenarios.

Some providers may need some weeks to reach desired capacity. How to proceed?

In case the user wants to consider that provider capacity increases with time, the user may need to unprotect the sheets (password: flu), and unhide column G in *Scenario 1*, *Scenario 2*, and *Scenario 3* worksheets.

REFERENCE

[1] Schwerzman et al. “Evaluating the Impact of Pharmacies on Pandemic Influenza Vaccine Administration,” Disaster Medicine and Public Health Preparedness.