

Costing Tool for School Reopening and Learning Recovery: The Manual

August 17, 2021

Introduction

This manual accompanies the World Bank's *Costing Tool for School Reopening and Learning Recovery*, which is an Excel-based, interactive tool to help

- i) estimate the cost of implementing measures to ensure the safety of the education community, recover learning, and support the emotional wellbeing of children, while reaching the most marginalized populations;
- ii) identify sources of additional funding; and
- iii) estimate funding gaps, if relevant.

The tool generates two outputs automatically based on users' inputs. The first is a prepopulated, easy-to-print report that summarizes the additional cost needed to implement a school reopening plan, funding available from different sources, and any financial gaps between required and available funding. A second output is a list of materials and equipment to be purchased that can serve as the basis of a procurement plan.

The tool has 10 tabs:

- The introduction tab that explains how the tool is meant to work
- Seven tabs that require inputs from users on basic information about the school system and details of school reopening and learning recovery plans. This includes the education level(s) they are planning for, the number of students, the number of schools, the number of classes, the number of teachers and school staff, the prevailing unit prices for the resources listed in the tool, and the funding available from all sources. The tool also provides guidance on how to collect these inputs.
- Two output tabs

The tool has several features to make it easy and quick to fill out. First, based on guidelines on school reopening from UNESCO, UNICEF, the World Bank, the World Food Program, WHO, the UN Refugee Agency (UNHCR), the US Centers for Disease Prevention and Control, and other organizations, the tool automatically suggests 25 potential mitigation measures for schools to adopt. Users can check only the measures that their country plans to adopt from the general framework. Second, to ease the burden associated with data entry, the tool has an in-built default set of assumptions about the quantities of resources and their intensity of use. Resources related to the checked measures will be populated automatically based on default settings, which users can change based on their needs, using guidance provided in the tool. Third, to capture the uncertainties associated with disease prevalence, the tool also allows users to vary the percentage of students who attend in-person classes and the percentage of

schools and classes that provide in-person instruction to check the sensitivity of cost across different learning scenarios, ranging from remote instruction to hybrid learning to in-person instruction.

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This work is a product of staff of The World Bank. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of the Executive Directors of The World Bank or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work.

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What is this tool for?

Purposes

This interactive Excel-based tool aims to help i) identify the additional resources and their intensity of use needed to implement a school reopening plan and estimate the incremental cost of these resources; ii) identify and quantify potential funding sources; and iii) estimate funding gaps, if relevant. The tool will also help guide the planning and implementation of school reopening and learning recovery, as it will make clear which resources will be needed to implement school reopening plans, as well as their quantities and intensity of use.

Audience

Information generated from the tool would be useful for government officials, school leaders, international organizations and donors who are involved in the planning, budgeting, and financing of school reopening and learning recovery during and after the COVID-19 pandemic.

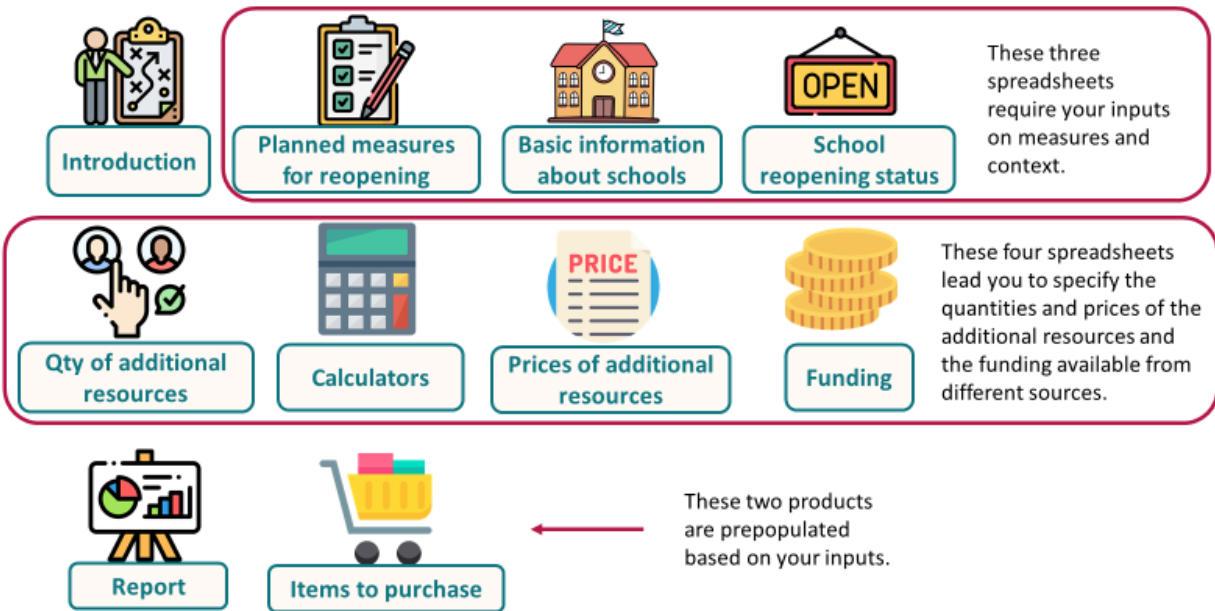
Users

We recommend that government officials or school leaders who are assigned to budgeting and planning for school reopening would collect the data needed for the tool and fill out the spreadsheets. Researchers, international organizations, donors, and foundations can also use the tool to provide technical assistance to governments and to estimate the costs of interventions implemented in response to COVID-19.

How is the tool structured?

The tool is composed of ten tabs, including one introduction tab, seven tabs that require inputs from the users and two tabs that prepopulate the results. The navigation bar is located on the top of each tab, and you can move from one tab to another by simply clicking on the relevant icons in the navigation bar.

Figure 1. Components of the tool



Tab 1 Introduction

The tab introduces what the tool is for and how to use the tool. We recommend users report bugs, suggest new features to add, or provide overall feedback to the development team, either by filling out [an online survey](#) anonymously or [emailing the developers](#) directly.

Tab 2 Planned measures for reopening

The tab lists 25 potential mitigation measures for schools to adopt grouped under 4 objectives, covering measures to i) ensure the safety of the education community, ii) recover learning, iii) support emotional wellbeing and recovery, and iv) reach the most marginalized populations. We derived this list of measures from guidance on school reopening published by UNESCO, UNICEF, the World Bank, the World Food Program, WHO, the UN Refugee Agency (UNHCR), the US Centers for Disease Prevention and Control, and other organizations (see Policy Guidelines in [References](#)).

Users of the tool can check the measures that apply to their context, and all data entry associated with unchecked measures will be filtered out of the rest of the tool. For some measures, it is possible to specify whether they are adopted in a) reopened schools that provide in-person classes, or b) all schools regardless of school reopening status, and all calculations will be adjusted automatically based on this specification. For example, differentiated instruction and personalized learning can be provided to all schools regardless of their opening status, or only the schools that provide in-person classes. [\[More details\]](#)

Tab 3 Basic information about schools

This tab asks for a brief description of the school reopening plan that will be costed. Users must specify the cost estimate of interest (for example, costs for primary school only) and the context that the cost estimate applies to (for example, all schools in a certain region for a certain time period). [\[More details\]](#)

Tab 4 School reopening status

In this tab, users specify i) the percentage of schools that provide in-person classes and ii) the percentage of students that attend in-person classes during the time period of interest. If schools are not all expected to return to in-person instruction at the same time (for example, rural schools are likely to reopen earlier than urban schools), this tab permits specification of the expected percentage of schools providing in-person or remote instruction across time. [\[More details\]](#)

Tab 5 Quantities of additional resources

This tab guides users to set parameters that affect the quantities of additional resources required during reopening. These resources refer to the *incremental* (or extra) personnel time, facilities, equipment and materials needed to adopt any *new* school operations required or recommended by the school reopening plan over and above the resources available in a business-as-usual situation. For example, teachers' salaries should not be considered as incremental costs if they are paid as usual. However, if teachers receive compensation to work overtime, either to participate in professional training on preventive measures or to substitute for a sick teacher, the overtime pay should be counted as part of the incremental cost. For resources that were used before the pandemic but will be needed in greater quantities during and after the pandemic (for example, disinfectant or water), users can specify assumptions on resource needs and current resource availability, and the tool will help estimate the additional quantity needed automatically. [\[More details\]](#)

Tab 6 Calculators

Users may require assistance in determining the quantity of some of the resources listed in Tab 5. We have developed multiple calculators to facilitate the estimation of quantities for some typical resources. The quantities of these resources are usually determined by multiple parameters. These resources include i) the number of teachers and staff needed, ii) disinfectant, iii) antiseptic and liquid soap for handwashing, iv) masks, v) automatic temperature sensors, oximeters and screening staff, and vi) remote learning platform development. The specification of parameters in these calculators will be factored into the prepopulated “quantity” estimation in Tab 7 [Prices of additional resources](#). We set up some default settings when guidelines or benchmarks are available in the literature. Users can choose to use these default settings or overwrite them with their own specifications. [\[More details\]](#)

Tab 7 Prices of additional resources

Using information that users specify in Tabs 5 and 6, this tab populates the quantities of additional resources and guides users to specify the price of each resource. With these inputs, the tool will calculate the *financial cost* of these additional resources needed and estimate whether a financial gap exists (Financial costs capture the monetary value of the resources that are paid for. Economic costs, on

the other hand, take into account the fact that some resources can be used beyond the time period of interest). For each resource, users can also specify i) whether the resource can be used beyond the time period of interest, and ii) if so, the expected lifetime of the resource (in months). These inputs will help estimate the *economic cost* of the additional resources needed in each pillar. [\[More details\]](#)

Tab 8 Funding

This tab helps users delineate any additional funding available. Since the tool costs out the additional resources needed above and beyond business-as-usual, users only need to specify the funding available from different sources above and beyond business-as-usual (that is, the budget for the same student population during the same time period in the pre-COVID-19 era). Potential funding sources could include COVID-19 relief packages, donations from the community, or savings from previous school closures. If funding from a certain source cannot be completely reallocated to COVID-19 responses, users can specify the percentage of this funding that is subject to reallocation. [\[More details\]](#)

Tab 9 Report

This tab generates a prepopulated, easy-to-print report in the format of a dashboard. The report summarizes the cost of the additional resources needed, the additional funding available, and amount of the financial gap, if relevant. It also shows the financial cost and economic cost of the additional resources needed by each area of intervention. The financial costs capture the monetary value of the resources that are paid for. Economic costs take into account the fact that some resources can be used beyond this time period of interest. For example, laptops are purchased during the time period of interest, but can still be used later. The *financial* cost of the purchased laptops would be the total cost of these laptops without any amortization – that is, the amount that would be paid to receive the laptops. If the expected lifetime of these laptops is three years, the *economic* cost of these laptops for one year of use would be approximately one third of the financial cost. [\[More details\]](#)

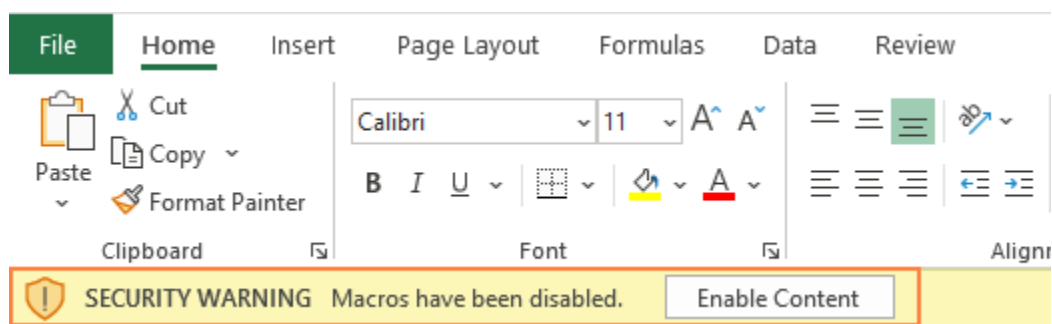
Tab 10 Items to purchase

This tab generates a list of materials and equipment that need to be purchased and their corresponding quantities. Note that the quantities in this tab present *total* needs, rather than the additional needs above and beyond business-as-usual. This list can be passed to a planning department or procurement department to guide the procurement and distribution of materials and equipment. [\[More details\]](#)

Getting started

1. Open the Excel file named “Costing Tool for School Reopening Plans.xlsm”.
2. Enable macros by clicking on “Enable Content” on the security warning message.

Figure 2. Enable macros



3. Following the navigation bar, fill out the input cells in the tabs labeled *Planned measures for reopening*, *Basic information about schools*, *School reopening status*, *Quantities of additional resources*, *Calculators*, *Prices of additional resources*, and *Funding*.
4. Formulas are set up in the output cells . Hover the mouse cursor over an output cell to see a description of the formula. By default, these cells are locked to reduce the possibility of unintentional changes. They can be unlocked, however, to customize the tool based on users' needs. To unlock a tab, click on "Review" -> "Unprotect Sheet" and input the password **cost**.

Where to get the required data?

Table 1 summarizes potential data sources for each of the seven tabs that inquire users' inputs.

Table 1. Potential data sources for the input tabs

Tab	Sources of data
Planned measures for school reopening	<ul style="list-style-type: none"> - School reopening plans issued by the Ministry of Education or the operating entity of the school(s) - International guidelines - Consultation with the unit in the Ministry of Education that oversees school reopening
Basic information about schools	<ul style="list-style-type: none"> - Education Management Information System (EMIS) - School census
School reopening status	<ul style="list-style-type: none"> - Consultation with the unit in the Ministry of Education that oversees school reopening
Quantities of additional resources	<ul style="list-style-type: none"> - School reopening plans - International guidelines - Consultation with the unit in the Ministry of Education that oversees school reopening - Consultation with Ministry of Public Health
Calculators	<ul style="list-style-type: none"> - School reopening plans

	<ul style="list-style-type: none"> - International guidelines - Consultation with the unit in the Ministry of Education that oversees school reopening - Consultation with Ministry of Public Health
Prices of additional resources	<ul style="list-style-type: none"> - Consultation with the procurement department - Past procurement records [Inflation adjustment is needed]
Funding	<ul style="list-style-type: none"> - Consultation with the budget unit in the Ministry of Education - Consultation with the Ministry of Finance

Example: How to fill in and use each tab?

Using a hypothetical example, we illustrate below how to fill in the input tabs and interpret the output tabs.

Tab 2 Planned measures for reopening

1. *Identify the measures to be adopted by schools during the time period of interest by checking the box in front of each measure.* Selection of measures can be guided by national or local school reopening plan(s) issued by the governments or consultations with the unit in the Ministry of Education that oversees school reopening. If national school reopening plans are not available, users can refer to international guidelines¹. In any case, planned measures in the default settings of the tool align with the school reopening framework launched by UNICEF, UNESCO, the World Bank, World Food Organization and the UN Refugee Agency (2020). In the example below, we have checked all measures.

2. *Specify whether measures apply to all schools or only to reopened schools.* A dropdown menu will show up once an input cell in the *Applicable to* column is clicked. In this illustrative example, teacher professional training will be provided to all schools, while most other measures only apply to reopened schools.

¹ Some of the international guidelines can be found in the “Background guidelines” section of the [References](#).

Figure 3. Planned measures for school reopening (Tab 2)

Measures	Explanation of the measures	Applicable to	Cost implications
Pillar 1: Measures related to safe operations			
<input checked="" type="checkbox"/> Establish cleaning and disinfecting measures	Schedule regular cleaning of the school facilities. Clean and disinfect classrooms and spaces used for instruction, common spaces, gyms, toilets, as well as frequently touched surfaces such as door handles, desks, toys, supplies, light switches, doorframes, play equipment, teaching aids used by children, and covers of books.	Reopened schools	Increase in cost
<input checked="" type="checkbox"/> Provide personal protective equipment	Enforce the school policy on wearing a mask or a face covering in line with national or local guidance. Provide sufficient medical masks for students and personnel. Introduce students with sensory concerns/tactile sensitivities to face coverings that are most comfortable for them.	Reopened schools	Increase in cost
<input checked="" type="checkbox"/> Provide hand hygiene materials	Create a schedule for frequent hand hygiene, especially for young children. Ensure handwashing strategies include washing with soap and water for at least 20 seconds. Handwashing/hand hygiene stations should be set up at school entrances and throughout the school (e.g., entrances and exits of gym and sports facilities, bathrooms, cafeteria, and classrooms).	Reopened schools	Increase in cost
<input checked="" type="checkbox"/> Provide on-site health screenings	Conduct simple health screening for body temperature and high-risk symptoms on entry into the building for all staff, students and visitors.	Reopened schools	Increase in cost

Tab 3 Basic information about schools

1. Choose the country/economy that the costing analysis will apply to from the dropdown list.

Figure 4. Basic information about schools (Tab 3, Q1)

Basic school information

1. Country/economy <Please choose the country/economy from the dropdown list>

2. Specify the school reopening plan to cost out.

Figure 5. Basic information about schools (Tab 3, Q2)

2. The school reopening plan to cost out

1) Name of the document

2) Link to the document

3) Which educational levels does the school opening plan apply to?

3. Identify which cost estimate is of interest using three dimensions of context - location, education level(s), and time period.
 - 1) Users can choose to estimate the cost of school reopening for the whole country, a specific region, a specific province/state, a specific district, or a specific school. Specify the name of the region, province/state, district or school of interest, and the name will pop up in the following instructions and the report. Note that the five options are exclusive, so you can only choose one option. Users will have to download and use separate excels file to estimate costs for separate locations.
 - 2) Users can select the education level(s) to focus on by checking the boxes and specifying the grade levels of the checked education levels. In this case, users can choose more than one education level in one excel file.

- 3) Users can specify the time period that the cost estimate applies to. They will have to specify i) the number of school days during this time period of interest and ii) the number of school days in an academic year.

Figure 6. Basic information about schools (Tab 3, Q3)

3. Which cost estimate is of interest to you?

1) Are you interested in estimating the cost of reopening schools for the whole country, a region/province/district, or a school?

The whole country
 A specific region
 A specific province/state
 A specific district
 A specific school

Malgudi <Please specify the name of the region>
 <Please specify the name of the province/state>
 <Please specify the name of the district>
 <Please specify the name of the school>

2) Which education level(s) do you want to cost out? For each education level you check, please specify the grade levels that provide in-person classes.

Pre-primary education
 Primary education
 Lower secondary education
 Upper secondary education
 Tertiary education

Ages 3-5 <Please specify the grade levels or age groups>
 K-3 <Please specify the grade levels>
 <Please specify the grade levels>
 <Please specify the grade levels>

3) Which time period does the cost estimate apply to, e.g., January - December 2021, the spring semester of 2021, the first quarter of 2021, academic year 2021-2022?

The Fall semester of 2021

Number of school days during the time period of interest, i.e., the fall semester of 2021: 90 days
 Number of school days in an academic year: 180 days

4. Here users provide basic statistics about schools for the education levels and locations of interest. This involves specifying the number of teachers, school staff, students, and classes, as well as a description of routine services provided in school.
- The numbers of students, schools, classes, students with special needs and currently available teachers and school staff are usually available in EMIS or school census.
 - The tool has a [calculator in Tab 6](#) to help estimate the demand of new teachers and school staff to hire. Note that the actual number of teachers and school staff that can be newly hired are determined by both the demand and the supply of new teachers and staff. When finalizing these estimates, users should take into consideration the feasibility of hiring new teachers and staff in a large scale within a short period of time.
 - The questions related to school bus, school lunch, diagnosis assessments and personalized learning only appear when users select the relevant measures in Tab 2 [Planned measures for school reopening](#).

Figure 7. Basic information about schools (Tab 3, Q4)

4. Basic statistics of the education levels of interest (i.e., pre-primary education, primary education,) in Malgudi, India

Students, schools and classes

Number of students: 2,000
 Number of schools: 10
 Number of classes: 100

Number of students per school: 200
 Number of students per class: 20
 Number of students with special needs: 100

Private schools included Yes No

Teachers and school staff

	Total	Currently available	Newly hired	
Number of teachers	105	100	5	<Calculator 1.1 helps you estimate the demand of new teachers>
Number of management staff	30	30		<Assume no new management staff are hired, but this can be overwritten.>
Number of teaching aids	25	15	10	<Calculator 1.2 helps you estimate the demand of teaching aids>
Number of non-teaching staff				
Cleaning staff	20	20	0	<Calculator 1.3 helps you estimate the demand of cleaning staff>
School nurses	12	10	2	<Calculator 1.3 helps you estimate the demand of school nurses>
School bus drivers	10	10		<Assume no new bus drivers are hired, but this can be overwritten.>
Food service staff	20	20		<Assume no new food service staff are hired, but this can be overwritten.>
Technical support staff	11	10	1	<Calculator 1.3 helps you estimate the demand of technicians>
Counselors	6	5	1	<Calculator 1.3 helps you estimate the demand of counselors>
Psychologists	6	5	1	<Calculator 1.3 helps you estimate the demand of psychologists>
Social workers	6	5	1	<Calculator 1.3 helps you estimate the demand of social workers>
Social mobilizers for the enrollment campaign	5	5	0	<Calculator 1.3 helps you estimate the demand of social mobilizers>
Other	0	0	0	

Number of teachers who work closely with students with special needs: 5 <The default setting assumes this number is proportional to the # of students with special needs>

School bus

% of students who take school buses
 In the COVID-19 era: 30% among those who attend school
 In the pre-COVID-19 era: 50% among those who attend school
 Full capacity of school buses on average: 20 students per bus

School lunch

% of schools who have lunch at school now: 90% among those who attend school

Diagnostic assessments

% of students to test: 95%

Personalized learning (in the format of tutoring)

% of students who need personalized learning: 20%

Facilities

How many classrooms share a restroom?: 4
 Teachers in how many classrooms share an office?: 4

5. Here users specify the currency of the cost estimates. All prices and cost estimates in the tool will be labelled in this currency.

6. Here users specify the year costs will be expressed in. The default setting is 2021. If the price of an item is obtained from another year, users will need to adjust the price for inflation (see more details in Tab 7 [Prices for additional resources](#)).

Figure 8. Basic information about schools (Tab 3, Q5 & Q6)

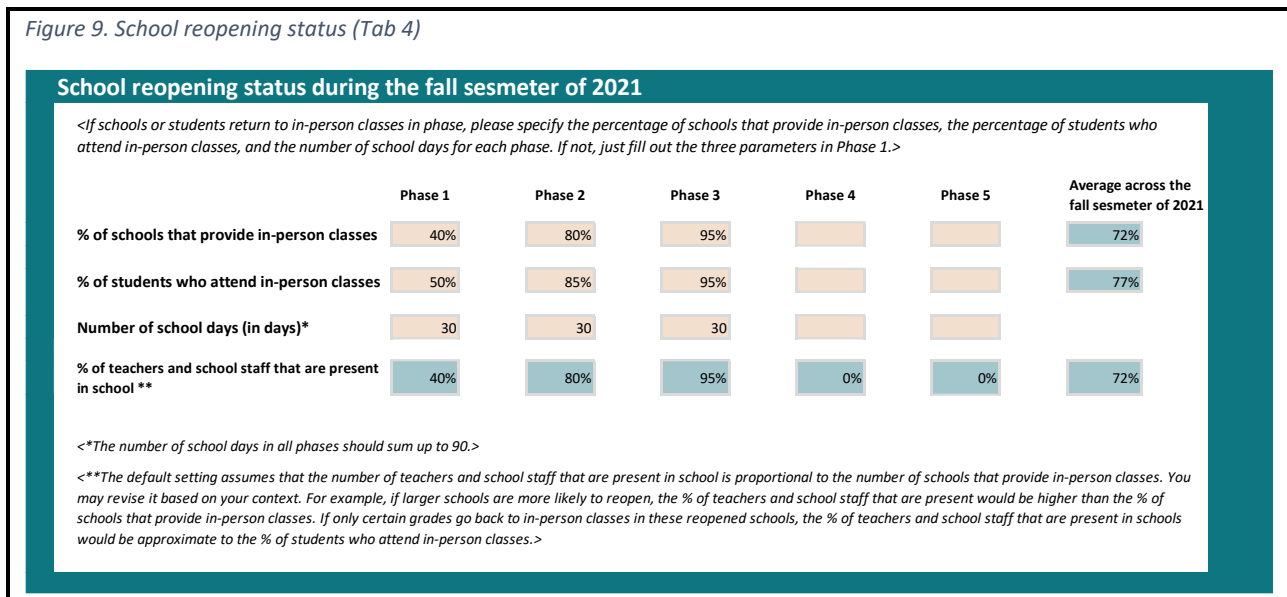
5. In which currency is the cost expressed? MRupee

6. In which year do you want to express the cost? 2021

Tab 4 School reopening status

Not all schools may reopen at the same time, and not all students may come back to school at the same time even if schools reopen, either because of parents' safety concerns or families' financial constraints. Specifying the expected school reopening status across phases allows users to capture some of this uncertainty in their cost estimates.

Figure 9. School reopening status (Tab 4)



If schools or students are expected to return to in-person classes in phases, users can specify i) the percentage of schools that provide in-person classes, ii) the percentage of students who attend in-person classes, and iii) number of school days for each phase. If the return to school will not be phased, users should just fill out the three parameters in Phase 1.

Note that the number of school days in all phases should sum up to “the number of school days during the time period of interest” that was specified in Q3(3) in Tab 3 [Basic information about schools](#).

The percentage of teachers and school staff that are present in school is another important factor that would affect the calculation of the quantities of additional resources required for reopening. The default setting assumes that the number of teachers and school staff that are present in school is proportional to the number of schools that provide in-person classes. Users can revise this assumption. For example, if larger schools are more likely to reopen, the percentage of teachers and school staff that are present would be higher than the percentage of schools that provide in-person classes. If only certain grades go back to in-person classes in these reopened schools, the percentage of teachers and school staff that are present in schools would be approximate to the percentage of students who attend in-person classes. To make revisions in **output cells**, unprotect the spreadsheet using the password **cost** and overwrite the formula.

The average percentage across the time period of interest (that is, the last column) is a weighted average of the corresponding percentages in all phases, with the weights proportional to the number of days in each phase.

Tab 5 Quantities of additional resources

A list of resources associated with the measures that were checked in Tab 2 [Planned measures for reopening](#) will prepopulate in this tab and the next tab [Prices of additional resources](#).

Users can follow the prompt questions in the *Parameter settings* column to identify the needs for all suggested resources. For resources that were provided before the pandemic, users should also identify current availability so that the tool can help estimate the gap to be filled (that is, additional quantities needed).

In this tab, users should fill in 0 or leave cells blank if a resource is not applicable to their context. Default settings are provided when guidelines or benchmarks are available. Users should check whether the default settings make sense for their contexts. If not, these settings can be overwritten. When a calculator is available, users can click on the hyperlink in the *Notes* column and answer the relevant prompt questions there.

If users lack either the time or capacity to go over all suggested resources, they can click on the orange button *Must-have* in the top left-hand corner of the sheet to get a shortened list that only includes big-ticket items that tend to be expensive, resources that cannot be excluded (for example, disinfectants for cleaning), and personnel. For example, five items are included in the *Must-have* list for establishing cleaning and disinfecting measures while there are 11 items in the full list. After the click, the orange button would be labelled as *Must-have + Nice-to-have*. Clicking it again would trigger the expansion of shortened list to the full list.

Figure 10. Quantities of additional resources (Tab 5)

Checked measures	Additional resources	Parameter settings	Notes
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>Must-have</p> </div> <div style="text-align: center;"> <p>Quantities of additional resources</p> </div> <div style="text-align: center;"> <p>PRICE</p> </div> <div style="text-align: center;"> <p>Shopping cart</p> </div> </div> <p style="text-align: right; font-size: small;"><Check whether the default settings make sense to you. If not, revise based on your context></p>			
Pillar 1: Actions related to safe operations			
Establish cleaning and disinfecting measures	Disinfectant		See Calculator 2.1 for details
	Empty containers for diluting cleaning and disinfection products	1 container(s) per cleaner (goal) 0.5 container(s) per cleaner (current availability)	
	Electrostatic disinfectant sprayers	1 sprayer(s) per cleaner (goal) 0.5 sprayer(s) per cleaner (current availability)	
	Mops, buckets and brushes	1 set(s) per classroom/restroom/office (goal) 0.5 set(s) per classroom/restroom/office (current availability)	
	Soap bars	1 soap bar(s) per classroom/restroom/office	
	Water	4 time(s) more than the water usage in the pre-COVID-19 era	<i>The increase in water usage is mainly caused by higher frequency of cleaning and higher frequency of handwashing. For example, if cleaning was conducted weekly in the pre-COVID-19 era but daily during the COVID-19 era, 4 times more water would be needed (i.e., 1 / (1/5) - 1). If students were required to wash their hands twice a day in the pre-COVID-19 era but five times now, 1.5 times more water would be needed (i.e., 5/2 - 1). The default value is the larger number of these two ratios.</i>
	Rubber gloves for cleaning staff	2 pair(s) per cleaner (goal) 1 pair(s) per cleaner (current availability)	
	Disposable gowns for cleaning staff	1 set(s) per cleaner per day	
	Reusable gowns and caps for cleaning staff	2 set(s) per cleaner (goal) 1 set(s) per cleaner (current availability)	One pair for classes and one pair for restroom per cleaner.
	Newly hired cleaning staff	10 FTE(s)	
Overtime payment for cleaning staff	0 hour(s) per cleaner per day		
Provide personal protective equipment	Reusable masks		See Calculator 4.1 for details
	Disposable masks		See Calculator 4.2 for details
	Face shields	1 face shield(s) per teacher or school staff	

Tab 6 Calculators

Calculator 1. How to estimate the number of new teachers and staff needed

In the calculator, we assume that the demand for new teachers is driven by two purposes: to ensure smaller class size to maintain social distancing and to substitute for teachers who are on sick leave because of COVID-19 infection or conditions that exhibit similar symptoms. We also assume that teacher aides are only hired to provide personalized learning in the format of one-on-one or small-group tutoring. Once the prompt questions are answered, the number of teachers and teacher aides to hire will be automatically generated.

For cleaning staff, school nurses, technicians, counselors, psychologists, social workers, and social mobilizers to conduct enrollment campaigns, the calculator helps users estimate the number of new staff to hire *per school* once users specify (i) the number of schools served by each person (for example, staff hired at the school level usually serve one school, while staff hired at the district level could serve multiple schools at the same time), (ii) the staff-student ratio (that is, X staff member per Y students), (iii) and maximum and minimum caps. If there are no maximum or minimum restrictions, users should leave these cells blank.

Note that the outputs of this calculator are not automatically fed into the column of the number of newly hired staff in Section 4 of Tab 3 [Basic information about schools](#). This is because these populated

numbers only represent *the demand* for new teachers and staff. The actual numbers that can be newly hired are determined by both the demand and the supply of new teachers and staff. When finalizing these estimates, users will need to take into consideration the feasibility of hiring new teachers and staff in a large scale within a short period of time.

Figure 11. Calculator 1: How to estimate the number of new teachers and staff needed

Calculator 1. How to estimate the number of new teachers and staff needed

<Note that the populated numbers only represent the demand of new teachers and staff. The actual numbers that can be newly hired are determined by both the demand and the supply of new teachers and staff. When finalizing these estimates, please take into consideration the feasibility of hiring new teachers and staff in a large scale within a short period of time in your context.>

1.1. Teachers

a) Ensure smaller class size to maintain social distancing

Current class size	20 students/class
Targeted cohort size	10 students/cohort
Number of new teachers to hire for this purpose	100 teachers

<Cohorting denotes having the same small group of students (

b) Substitute for teachers who are on sick leave because of COVID-19 infection or conditions that exhibit similar symptoms

% of current teachers who may take sick leave during the fall semester of 2021	5%
The average days of sick leave	20 day(s)
Number of hours per working day	8 hour(s)
Total number of hours that need to be substituted	800 hour(s)
% of these hours that can be covered by current teachers	10%
Number of new teachers to hire for this purpose	1 teacher(s)

Total number of teachers needed to ensure smaller class size and substitute for sick teachers: 101 teacher(s)

1.2. Teaching aids to provide personalized learning in the format of tutoring

The number of hours of tutoring a student needs to attend per day	1 hour(s) per day
Format of tutoring	One aid for 1.5 student(s)
The total number of working hours for teaching aids	204 hour(s)
Number of working hours per day	8 hour(s) per day
Number of teaching aids needed in total	26 teaching aid(s)
Number of new teaching aids to hire	11 teaching aid(s)

1.3. Non-teaching staff

Rules of thumb to determine the quantity <Leave the cell blank if there is no min requirement> <Leave the cell blank if there is no max req

Staff Type	Serving	per	for	with a min of	per	per
Cleaning staff	1 school(s)	1 cleaner(s) per	150 students,	1 per school and a max of	10	per school
School nurses	1 school(s)	1 nurse(s) per	150 students,	1 per school and a max of	10	per school
Technicians	1 school(s)	1 technician(s) pe	150 students,	1 per school and a max of	10	per school
Counselors	2 school(s)	1 counselor(s) pe	250 students,	per 2 schools and a max of		per 2 schools
Psychologists	2 school(s)	1 psychologist(s)	250 students,	per 2 schools and a max of		per 2 schools
Social workers	5 school(s)	1 social worker(s)	250 students,	per 5 schools and a max of		per 5 schools
Social mobilizers	5 school(s)	1 social mobilizer	500 students,	per 5 schools and a max of		per 5 schools

Number of students in a school: 200 <The default setting is the average number of students in a school.>

Staff Type	Needed per school	Currently available per school	New staff to hire per school
Cleaning staff	2.0	2.0	The number of staff is sufficient
School nurses	2.0	1.0	1.0
Technicians	2.0	1.0	1.0
Counselors	1.0	0.5	0.5
Psychologists	1.0	0.5	0.5
Social workers	0.8	0.5	0.3
Social mobilizers	0.4	0.5	The number of staff is sufficient

Calculator 2: How to calculate the quantity of disinfectant needed

The quantity of disinfectant required is largely determined by four factors: (i) the total area to be disinfected using spray, (ii) the quantity of mixed solution required per square meter, (iii) the dilution rate, and (iv) the frequency of disinfection. The quantity of mixed solution required per square meter and the dilution rate differ from product to product, and users can identify this information on the product label of the disinfectant.

Since it is very likely that disinfectant had been used before the pandemic, the calculator assumes that the same type of disinfectant is used during the pandemic, only with a higher frequency of disinfection.

Once users specify frequencies in the pre-COVID-19 era and in the COVID-19 era, the calculator will generate the additional quantity needed. Note that when users are not sure about certain numbers, they are encouraged to specify the maximum of a reasonable range.

Figure 12. Calculator 2: How to calculate the quantity of disinfectant needed

Calculator 2. How to calculate the quantity of disinfectant needed

<For disinfection, the WHO recommends using sodium hypochlorite (bleach or chlorine) at a concentration of 0.1 percent or 1,000ppm (1 part of 5% strength household bleach to 49 parts of water) or solutions containing 70 to 90 percent alcohol.>

2.1. For a typical school

Factor 1: Area to be disinfected using spray	450 square meter(s)	<This is a conservative estimate as we assume that once a school reopens, all the facilities need to be disinfected, regardless how many students come to school.>
Area of a typical classroom		
Length of the floor for a typical classroom	4 meter(s)	
Width of the floor for a typical classroom	3 meter(s)	<Length * width>
Area of the floor for a typical classroom	12 square meter(s)	
Area of the room (including all walls, floor and ceiling)	30 square meter(s)	<The rule of thumb is 2.5 times of the area of the floor>
The total number of rooms (including classrooms, bathrooms and offices) to disinfect in a typical school	15 Room(s)	<Average number of classrooms per school * (1 + 1/classroom-bathroom ratio + 1/classroom-office ratio)>
Factor 2: Quantity of mixed solution required	0.05 liter(s) per square meter	<See the product label>
Factor 3: Dilution rate	5%	<See the product label. The rate is the amount of the concentrated disinfectant divided by the amount of water needed.>
Factor 4: Frequency of disinfection		
In the COVID-19 era	1 time(s) per day	
In the pre-COVID-19 era	1 time(s) per week	<School facilities are recommended to be cleaned and disinfected at least daily.>
The quantity of disinfectant needed to spray a typical school per day		
In the COVID-19 era	1.125 liter(s)	<Factor 1 * Factor 2 * Factor 3 * Factor 4 for the COVID-19 era>
In the pre-COVID-19 era	0.225 liter(s)	<Factor 1 * Factor 2 * Factor 3 * Factor 4 for the pre-COVID-19 era>
Gap	0.9 liter(s)	

2.2. For a school bus

Factor 1: Areas to be disinfected using spray	61.00 square meter	
Length of the bus	8.00 meter	<Mini School Bus: 6.1-7.6 meters; Mid-Sized School Bus: 7.6-10.7 meters; Full-sized school buses: 10.7+ meters>
Width of the bus	2.55 meter	
Height of the bus	2.99 meter	
Area of the bus (including all walls,	61.00 square meter	<Length * width * height>
Factor 2: Quantity of mixed solution required	0.05 Liter per square meter	<See the product label>
Factor 3: Dilution rate	5%	<See the product label. The rate is the amount of the concentrated disinfectant divided by the amount of the water>
Factor 4: Frequency of disinfection		
In the COVID-19 era	1 time per trip	
In the pre-COVID-19 era	1 time per week (e.g., 2 trips a day, 5 days per week)	
The quantity of disinfectant needed to spray a bus per trip		
In the COVID-19 era	0.15 liter(s)	<Factor 1 * Factor 2 * Factor 3 * Factor 4 for the COVID-19 era>
In the pre-COVID-19 era	0.02 liter(s)	<Factor 1 * Factor 2 * Factor 3 * Factor 4 for the pre-COVID-19 era>
Gap	0.14 liter(s)	

Notes. If you are not sure about certain numbers, try to overestimate them.

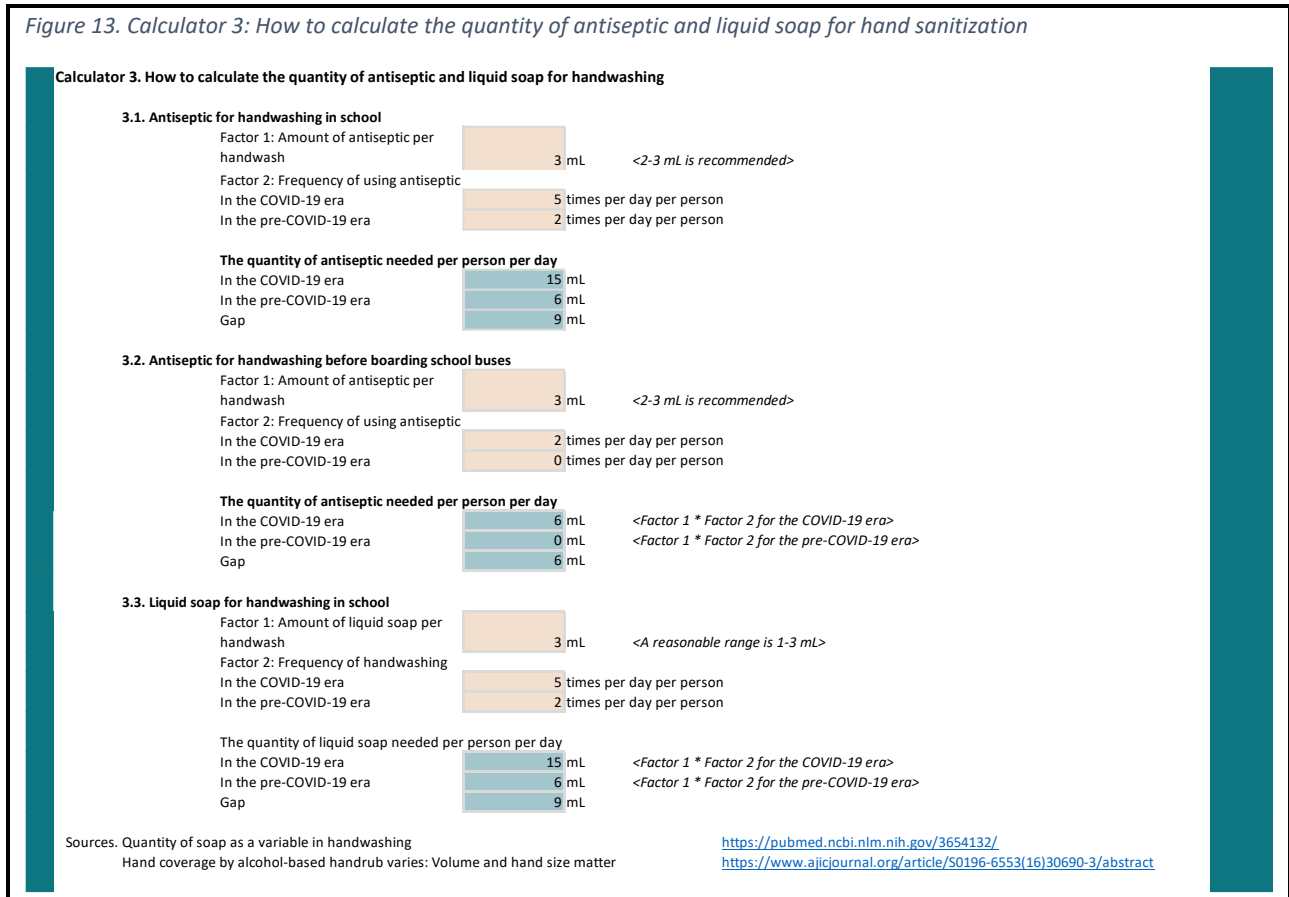
Sources. Addressing disease mitigation in schools, day cares & universities with sanitizers and disinfectants: <https://www.youtube.com/watch?v=xhS-AhciaFM&feature=youtu.be>
 Guidance for cleaning and disinfecting: Public spaces, workplaces, businesses, schools and homes: https://www.cdc.gov/coronavirus/2019-ncov/community/pdf/reopening_america_guidance_for_cleaning_and_disinfecting_public_spaces_workplaces_businesses_schools_and_homes_20200814.pdf
 Cleaning and disinfection for community facilities: <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/clean-disinfecting-community-facilities.html>
 Calculations and application of disinfection: <http://www.fao.org/3/a1877e/a1877e00.pdf>
 Disinfecting cost calculator: <https://blog.midwestind.com/disinfecting-cost-calculator/>
 What is the average size of a school bus?: <https://www.trackschoolbus.com/blog/what-is-the-average-size-of-a-school-bus/>

Calculator 3: How to calculate the quantity of antiseptic and liquid soap for hand sanitization

The quantity of antiseptic and liquid soap needed for hand sanitization is affected by the amount of antiseptic or liquid soap used per handwash and the frequency of hand sanitization per day per person.

The default settings for the amount of antiseptic and liquid soap used per handwash are adopted from two relevant studies in non-education settings, with one focusing on personnel working in a hospital (Larson et al., 1987) while the other testing visitors of an infection prevention and control conference (Zingg, Haidegger & Pittet, 2016). Although the subjects in these two studies are adults who have larger palms, children may cause more waste of antiseptic or liquid soap than adults during the process of pumping and rubbing. Therefore, we followed the recommendations in these two studies without adjustment.

Figure 13. Calculator 3: How to calculate the quantity of antiseptic and liquid soap for hand sanitization



Calculator 4. How to calculate the number of masks

The WHO (2020a) recommends the following protocols for the use of masks for children and educators in the context of COVID-19. It should be noted that mask protocols have been modified throughout the pandemic.

- 1) Children under five years should not be required to wear masks.
- 2) For children between the ages of 6 and 11, the use of mask should be based on:
 - Whether there is widespread transmission in the area
 - Ability of the child to safely and appropriately use a mask
 - Access to clean and replacement masks
 - Adequate adult supervision
 - Potential impact on learning and psychosocial development
 - Specific settings and interactions with persons at higher risk

- 3) Children 12 years and older should wear a mask under the same conditions as adults
- 4) Teacher and support staff should wear masks when they cannot guarantee at least a 1-meter distance from others or if there is widespread transmission in the area.

Table 4.1 in Calculator 4 helps users estimate the number of reusable masks and Table 4.2 helps estimate the number of disposable masks. Note that children in different age groups need masks in different sizes. Clear masks that are transparent for full-mouth visibility need to be prepared for teachers and staff who regularly interact with students who are deaf or hard of hearing, students learning to read, students with disabilities, and those who rely on lip reading as a part of learning.

Figure 14 Calculator 4: How to calculate the number of masks

Calculator 4. How to calculate the number of masks

Advice on the use of masks for children in the community in the context of COVID-19

- 1) Children under five years should not be required to wear masks.
- 2) For children between the ages of 6 to 11, the use of mask should be based on:
 - Whether there is widespread transmission in the area
 - Ability of the child to safely and appropriately use a mask
 - Access to clean and replacement masks
 - Adequate adult supervision
 - Potential impact on learning and psychosocial development
 - Specific settings and interactions with persons at higher risk
- 3) Children 12 years and older should wear a mask under the same conditions as adults
- 4) Teacher and support staff should wear masks when they cannot guarantee at least a 1-meter distance from others or if there is widespread transmission in the area.

4.1. Reusable masks

Mask type	Eligible population	# of people	% present in school	# of masks per person	# of masks in total	Price	Cost
Small masks	Children aged 3-5 years old		77%		0		0
Medium masks	Children aged 6-11 years old		77%		0		0
Large masks	Students aged 12 years old and above		77%		0		0
Large masks	Teachers and staff	256	72%	1	183	0.5	92
Clear masks	Teachers and staff who regularly interact with students		72%		0		
Total					183	0.5	92

4.2. Disposable masks

Mask type	Eligible population	# of people	% present in school	# of masks/person/day	# of masks in total	Price	Cost
Small masks	Children aged 3-5 years old		77%		0		0
Medium masks	Children aged 6-11 years old		77%		0		0
Large masks	Students aged 12 years old and above		77%		0		0
Large masks	Teachers and staff	183.5	72%	1	11833.6		0
Total					11833.6	0	0

Sources: Advice on the use of masks for children in the community in the context of COVID-19 https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC_Masks-Children-2020.1

Calculator 5: How to calculate the number of automatic temperature sensors, oximeters, and screening staff

The quantity of the equipment and staff needed for on-site screening is calculated using the equipment/staff-student ratio and minimum and maximum caps. The minimum and maximum caps are not required and can be left blank when not applicable. The default settings for the rules of thumb to determine the quantity of automatic temperature sensors and oximeters are adopted from [the school reopening strategy published by the Ministry of Education in Chile](#).

Figure 15 Calculator 5: How to calculate the number of automatic temperature sensors, oximeters and screening staff

Calculator 5. How to calculate the number of automatic temperature sensors, oximeters and screening staff

Rules of thumb to determine the quantity <Leave the cell blank if there is no min requirement> <Leave the cell blank if there is no max req

Automatic temperature sensors	1 piece(s)	150 students, with a min of	2 per school and a max of	10 per school
Oximeters	1 piece(s)	150 students, with a min of	2 per school and a max of	10 per school
Screening staff	1 screen	150 students, with a min of	per school and a max of	per school

Number of students in a school	200 <The default setting is the average number of students in a school.>
Number of automatic temperature sensors needed in	2
Number of oximeters needed in a school	2
Number of screening staff needed in a school	2

Notes. The default setting for the rules of thumb to determine the quantity of automatic temperature sensors and oximeters is based on the school reopening strategy published by the Ministry of Education in Chile (<https://sigamosaprendiendo.mineduc.cl/documentos/>).

Calculator 6. How to estimate the cost of developing a remote learning platform

While the tool aims to guide school reopening, it allows for situations in which some schools may continue to provide remote classes for a while, either because schools adopt a hybrid model to reduce the number of students in class, or because schools may be closed again when Covid-19 cases in the community surge. Calculator 6 provides a framework to estimate the cost of developing a remote learning platform. In terms of personnel, the calculator leads you to identify who are involved (for example, content experts, technicians, etc.) in the process of content development, platform development and platform maintenance, the number of people in each category, the average number of working days devoted to this task, and the average daily rate of different types of personnel. The development and maintenance of a remote learning platform may also involve spending in hardware, data storage, etc. The total cost is the sum of personnel cost, hardware, data storage and other costs.

Figure 16. Calculator 6: How to estimate the cost of developing a remote learning platform

Calculator 6: How to estimate the cost of developing a remote learning platform

	Who are involved in the phase?	Roles and responsibilities	# of people in the category	# of working days devoted to this task	Average daily rate	Total cost
Personnel						
Content development						0
						0
						0
Platform development						0
						0
						0
Maintenance of the platform						0
						0
						0
Hardware						
Data storage						
Other						
Total						0

Tab 7 Prices of additional resources

The measures and resources prepopulated in this tab correspond to the measures that users checked in Tab 2 [Planned measures for reopening](#) and the type of list selected in Tab 5 [Quantities of additional resources](#) (that is, *Must-have* or *Must-have + Nice-to-have*).

1. In this tab, users should assess whether the prepopulated quantity for each resource makes sense for their context. Hovering the cursor on the cell provides a description of the formula that generates this quantity in the formula bar.

Figure 17. Prices of additional resources (Tab 7, columns to fill in for estimating financial costs)

Checked measures	Additional resources	Quantity	Unit	Price (in MRupee)	Total additional cost
Pillar 1: Measures related to safe operations Establish cleaning and disinfecting measures	Disinfectant	581	liter(s)	1.00	580.50
	Empty containers for diluting cleaning a	7	piece(s)	100.00	716.67
	Electrostatic disinfectant sprayers	7	piece(s)	100.00	716.67
	Mops, buckets and brushes	54	set(s)	100.00	5,375.00
	Soap bars	108	piece(s)	100.00	10,750.00
	Water	29	time(s) * school(s)	1.00	28.67
	Rubber gloves for cleaning staff	14	pair(s)	100.00	1,433.33
	Disposable gowns for cleaning staff	1,290	set(s)	100.00	129,000.00
	Reusable gowns and caps for cleaning s	14	set(s)	100.00	1,433.33
	Newly hired cleaning staff	0	FTE(s)	1,000.00	0.00
	Overtime payment for cleaning staff	0	hour(s)	1.00	0.00

Take the quantity of disinfectant, for example. The formula indicates that four parameters are factored into the calculation of this quantity: the additional amount of disinfectant needed per school per day above and beyond business-as-usual, the number of schools, the percentage of schools that provide in-person classes, and the number of school days during the time period of interest. If users prefer to fill in their own quantity estimate, they can unprotect the spreadsheet using the password **cost**, and then overwrite the formula. If the formula makes sense, users can check whether the values that they assigned to these four parameters in Tab 5 [Quantities of additional resources](#) and Tab 6 [Calculators](#) are reasonable. To locate the cells that are labelled as the parameters (for example, *disinfectant_per_school_per_day_gap*, *N_school*, etc), users can go to “Formulas” -> “Name Manager”.

2. In this tab, users also need to collect and fill in the prices for all resources in the currency that was specified in Section 5 in Tab 2 [Basic information about schools](#). The department responsible for procurement will likely have a record of past prices as well as an up-to-date list of prices of goods procured regularly in the Education sector. Note that the prices of some resources may rise during the pandemic due to hoarding or an increase in the cost of materials, production, and distribution. If users must refer to past procurement records, prices will need to be adjusted for inflation.
3. When users slide the horizontal scroll bar to the right, they will see two columns of questions that will eventually help you estimate [economic costs](#). The first question is whether this resource can be used beyond the time period of interest specified in Section 3 of Tab 3 [Basic information about schools](#). Users can type in “Yes” or “No” in these input cells. If the answer is “Yes”, users should then fill in the expected lifetime of this resource in months. Assuming that there are 20 school days in a month, the economic cost of a specific resource for this period of time is estimated using the following formula.

$$\text{Economic cost} = \frac{\text{Financial cost of a resource}}{\text{Expected lifetime in months}} \times \frac{\text{Number of schools days}}{20 \text{ school days/month}}$$

Figure 18. Prices of additional resources (Tab 7, columns to fill in for estimating economic costs)

Checked measures	Additional resources	Can this resource be used beyond the fall semester of	If yes, what is the expected lifetime of this resource? (In months)	Economic cost
Pillar 1: Measures related to safe operations Establish cleaning and disinfecting measures	Disinfectant			2,902.50
	Empty containers for diluting cleaning a	Yes	24	859.38
	Electrostatic disinfectant sprayers	Yes	36	572.92
	Mops, buckets and brushes	Yes	12	10,078.13
	Soap bars			53,750.00
	Water			143.33
	Rubber gloves for cleaning staff	Yes	12	3,437.50
	Disposable gowns for cleaning staff			709,500.00
	Reusable gowns and caps for cleaning s	Yes	12	3,437.50
	Newly hired cleaning staff			500.00
	Overtime payment for cleaning staff			0.00
	Provide personal protective equipment	Reusable masks	Yes	12
Disposable masks				103,544.00
Face shields		Yes	12	602.00

Tab 8 Funding

Users should consult with the budget unit in the Ministry of Education and the Ministry of Finance to identify additional resources available above and beyond the budget for the same student population in the pre-COVID-19 era. This could include i) savings resulting from previous school closures and the cancellation of field trips, events and extracurricular activities, and ii) additional funding from donations, international organizations, etc.

Users can specify i) the amount of funding available for each funding source and ii) the percentage of the funding that can be reallocated to COVID-19 response. The total funding available to cover the cost of the additional resources needed to adopt measures checked in Tab 2 [Planned measures for reopening](#) will be calculated automatically.

Figure 19. Funding (Tab 8)

Funding source	Amount available	% subject to reallocation	Total funding
Savings from the cancellation of field trips, events, and extracurricular activities	10,000.00	100%	10,000.00
Savings from previous school closure	10,000.00	100%	10,000.00
External funding	101,000.00	100%	101,000.00
COVID-19 relief package	800,000.00	100%	800,000.00
Donation	10,000.00	100%	10,000.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00

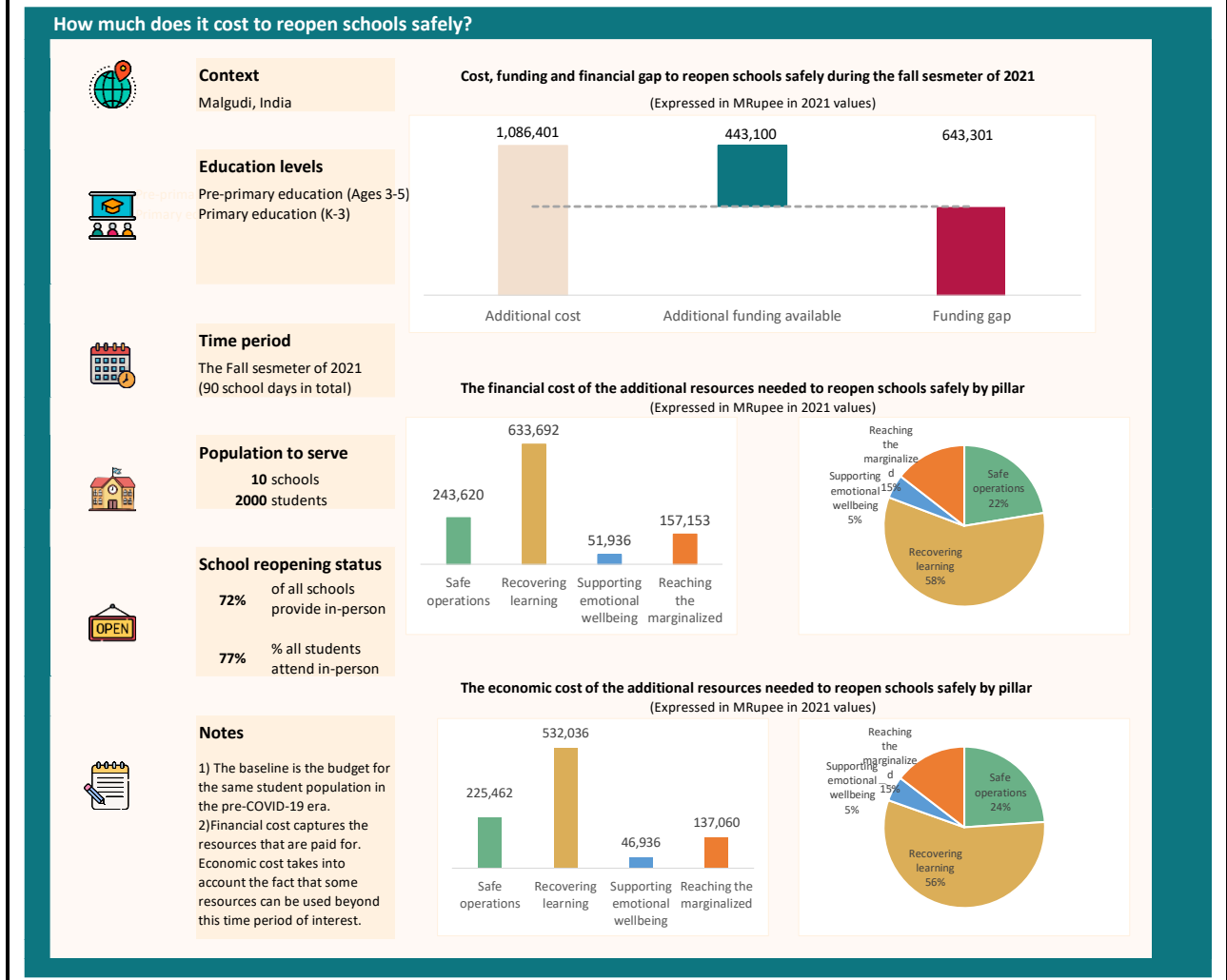
Tab 9 Report

The report is prepopulated using responses from previous tabs and cannot be revised in this spreadsheet. To make any changes, users will need to go back and make adjustments to the input tabs. The figure on the top right corner summarizes the total cost of the additional resources required, additional funding available, and the financial gap if relevant. If the additional funding available exceeds the total cost of the additional resources required, the financial gap is shown as 0. The report also shows the financial cost and the economic cost of the additional resources needed by area of intervention (that is, safe operations, recovering learning, supporting emotional wellbeing, and reaching the marginalized), which can be used to facilitate the policy dialogue on resource needs and financial sustainability.

If the results do not make sense given alternative budget projections (that might not have taken a micro-costing approach), here are a few suggestions for troubleshooting.

- Check the parameters that describe the context of the analysis on the left pane of the report. Users can go back to Tab 3 [Basic information about schools](#) and Tab 4 [School reopening status](#) to make revisions.
- If the financial gap is large and the government or school has limited scope for bridging the gap, users may consider going back to Tab 2 [Planned measures for reopening](#) to unselect some optional or secondary measures. In addition, they should check the parameters that determine the quantities of the additional resources in Tab 5 [Quantities of additional resources](#) and Tab 6 [Calculators](#) to see whether it is possible to reduce the intensity of use for some resources.
- If the distribution of the financial cost by area of intervention does not make sense, users should check whether the relevant measures are selected and the intensity of use for the related resources is sufficient.

Figure 20. Report



Tab 10 Items to purchase

A list of materials and equipment that need to purchased is generated automatically. Note that the quantities in the list represent the total needs, not the additional needs above and beyond the business-as-usual. This list can be passed to the procurement department for materials procurement. If any quantity estimate does not make sense, go back to Tab 5 [Quantities of additional resources](#) and Tab 6 [Calculators](#) to check whether assigned values for the relevant parameters are reasonable.

Figure 21. Items to purchase

Items to purchase (materials and equipment)	Quantity	Unit
Disinfectant	3,628	liter(s)
Empty containers for diluting cleaning and disinfection products	46	piece(s)
Electrostatic disinfectant sprayers	46	piece(s)
Mops, buckets and brushes	269	set(s)
Soap bars	538	piece(s)
Rubber gloves for cleaning staff	92	pair(s)
Disposable gowns for cleaning staff	7,095	set(s)
Reusable gowns and caps for cleaning staff	92	set(s)
Reusable masks	1,605	piece(s)
Disposable masks	103,544	piece(s)
Face shields	1,605	piece(s)
Alcohol-based antiseptic (at least 70 percent alcohol)	12,517	liter(s)
Antiseptic dispensers	538	piece(s)

How to translate the tool into another language?

The tool is accompanied by a version with instructions on translation, in which we provide detailed explanation on how to translate the contents of the tool into another language without damaging the macros and the formula embedded in the tool. Users are encouraged to share this version with collaborating translators, if translation is needed.

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Background guidelines

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