

Assignment #5

Estimate the value of preventing or caring for a disease

50 points maximum | Due on December 4th, 2024 by 11:59 pm EST

Enter your name:

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About the technology evaluation (your assignment)

Assignment #1	a) Define the intervention [1]	[1] Sept 4 th
Part 1	b) Select appropriate outcomes to evaluate it [2]	[2] Sept 20 th
Part 2	c) Report its effectiveness [2]	
Assignment #2	d) Plan the intervention	September 20 th
	e) Assess its (programmatic) costs	
Assignment #3	f) Design a cost of illness study to define the counterfactual	October 11 th
	g) Assess the financial and economic cost of illness	
Assignment #4	h) Evaluate the demand for such an intervention	October 18 th
> Assignment #5	i) Prepare a summary of the context of the intervention, focusing on the country and population of interest	December 4 th
	j) Run a SWOT analysis	
	k) Discuss its potential (and unmeasured) social impact	
Presentation	l) Present your findings in a report and oral presentation.	November 15 th

About the context of the intervention (the national context)

The intervention costs and benefits were calculated through Assignments #1, #2, and #3. In this assignment, you will use these estimates and apply them to your country's population to estimate the benefits at the national level. You will also discuss the context of your country of interest, highlighting how the intervention would be implemented and financed and what elements in its design or in the environment could reinforce or threaten it. Finally, you will give a critical perspective over the role your organization (GMU) and the sponsor (GIFT) want to play in the country as external/foreign organization, and what it could mean for global health.

About the final deliverable (the deliverable)

Like the previous assignments, this assignment is structured as several questions that can be answered over the course of weeks 8 to 11. However, the last instructions ("Final deliverable", 25 points) will ask you to collate your work from all the previous assignments into an **attractive, detailed, and policy/advocacy-friendly** report. Figures, tables, and text boxes are strongly encouraged.

Scale-up study

(10 points)

You estimated the cost and benefits of the intervention or program for an “experimental” sample of 10,000 people in your cost-effectiveness analysis. Typically, researchers and managers follow such a study with a “scale-up study”, which applies these estimates to the target population in the country. Such study considers limitations to the intervention’s roll-out, such as trying to serve/reach a large number of people over a large territory and a variety of contexts. For instance, it may be easy to reach the first 10 million people living in urban areas, and particularly challenging for the next 5 million living in rural areas.

1. Estimate the total annual cost of the intervention in the country. (5 points)

You calculated the target population size in Q.1 of Assignment #4 for the current (or a recent) year.

However, the target population size may change annually: for instance, if your target population is newborn babies, the annual size will be the annual birth cohort. If your target population are individuals above 65 years of age, your population will increase by the number of people who became 65 years old and decrease by the number of people who passed away. For this exercise, we will assume that your target population remains **constant** over the years (same number of individuals entering and leaving the cohort).

You can use target population size estimate from Assignment #4.

Furthermore, the intervention may or may not target the full target population at once. For instance, if we plan to roll-out a new vaccine that will be given to everyone in the population, we may not be able to do so in a year. If your intervention involves a large (> 10 millions) target population, you should think about a gradual roll-out that follows what you specified in Q.1 of Assignment #4, *i.e.* the number of users that may be served per year. If this is the case of your intervention, **briefly describe your reasoning in the box below.**

The 2019 PKH program targets Indonesia's poorest 20% of households, totaling 13.53 million households. Due to this large population, a gradual roll-out is necessary. We propose serving 25% annually (about 2.706-3.38 million households per year). This phased approach ensures effective resource management, adequate training for Community Health Workers (CHWs), and continuous monitoring and evaluation. It maintains program quality, avoids overwhelming the system, and allows flexibility to address challenges. Over a four- to five-year period, this strategy ensures the intervention sustainably reaches the full target population.

While this is one approach, I also have information from a PKH research study that showcased the history of beneficiary families who were treated starting in 2008 and all the way until 2019. I've attached that figure below.

Table 1 - PKH Expansion over the Years

Year	Number of Provinces	Number of Districts/ Cities	Number of Sub-districts	Number of Beneficiary Families	Program Budget (IDR millions)
2007	7	48	337	387,947	843.6
2008	13	70	637	620,848	981.8
2009	13	70	781	726,376	1,100.0
2010	20	88	946	774,293	1,300.0
2011	25	119	1,387	1,052,201	1,610.0
2012	33	169	2,001	1,454,655	1,884.9
2013	33	336	3,417	2,326,533	2,951.5
2014	34	418	4,870	2,871,827	3,874.5
2015	34	472	6,080	3,511,088	5,580.2
2016	34	504	6,402	5,981,528	7,620.8
2017	34	509	6,730	6,228,810	11,340.0
2018	34	512	7,214	10,000,232	17,520.0
2019	34	512	6,709	9,841,270	32,747.1
2020	34	514	6,709	10,000,000	36,991.6

If you are using a gradual roll-out, specify the size of your target population for each of the first five years (you may add years as necessary). If not, simply enter your target population size in A1 only (no need to repeat it).

Table 1: Total annual cost. (Approach 1)

A1	Annual target population (Year 1)	2.706M
A2	Annual target population (Year 2)	2.706M
A3	Annual target population (Year 3)	2.706M
A4	Annual target population (Year 4)	2.706M
A5	Annual target population (Year 5)	2.706M

B	Cost per 10,000 users over 1 year (= “Total cost of the program over 1 year” in #2, Q.6)	15,325,300
C1	Total annual cost of the intervention (Year 1) = $A1 * B / 10,000$	4147627800
C2	Total annual cost of the intervention (Year 2) = $A2 * B / 10,000$	4147627800
C3	Total annual cost of the intervention (Year 3) = $A3 * B / 10,000$	4147627800
C4	Total annual cost of the intervention (Year 4) = $A4 * B / 10,000$	4147627800
C5	Total annual cost of the intervention (Year 5) = $A5 * B / 10,000$	4147627800

Table 2: Total annual cost. (Approach 2)

I forecasted the difference in reporting between 10,000,000 in 2020 with a growth rate calculated between 2007 and 2020.

A1	Annual Target Population (Year 1)	387,947
A2	Annual Target Population (Year 2)	232,901
A3	Annual Target Population (Year 3)	105,528
A4	Annual Target Population (Year 4)	47,917
A5	Annual Target Population (Year 5)	277,908
A6	Annual Target Population (Year 6)	402,454
A7	Annual Target Population (Year 7)	871,878
A8	Annual Target Population (Year 8)	545,294
A9	Annual Target Population (Year 9)	639,261
A10	Annual Target Population (Year 10)	2,470,440
A11	Annual Target Population (Year 11)	247,282
A12	Annual Target Population (Year 12)	3,771,422

A13	Annual Target Population (Year 13)	-158,962
A14	Annual Target Population (Year 13)	158,730
A15	Annual Target Population (Year 15)	770,000
A16	Annual Target Population (Year 16)	830,000
A17	Annual Target Population (Year 17)	900,000
A18	Annual Target Population (Year 18)	1,030,000
B	Cost per 10,000 users over 1 year (= "Total cost of the program over 1 year" in #2, Q.6)	15,290.600
C1	Total annual cost of the intervention (Year 1) = $A1 * B / 10,000$	59319478.68
C2	Total annual cost of the intervention (Year 2) = $A2 * B / 10,000$	35611993.15
C3	Total annual cost of the intervention (Year 3) = $A3 * B / 10,000$	16135879.25
C4	Total annual cost of the intervention (Year 4) = $A4 * B / 10,000$	7326803.558
C5	Total annual cost of the intervention (Year 5) = $A5 * B / 10,000$	42493839.83
C6		61537688.07
C7		133315500.4
C8		83378801.25
C9		97746932.6
C10		377745447
C11		37810936.36
C12		576673584.1
C13		-24306266
C14		24270791.76

C15		117737728.6
C16		126912097
C17		137615526.9
C18		157493325.2

2. Similarly calculate the benefits to society (or household or government if you did not use a societal perspective) provided by the intervention. (5 points)

You will use the final estimates from Q.6.b of Assignment #3. Report them below:

Table 3: Total annual benefits.

D1	Total cost per 100,000 individuals in <u>cases averted</u> (Year 1)	21564383.15
D2	Total cost per 100,000 individuals in <u>cases averted</u> (Year 2)	12946011.7
D3	Total cost per 100,000 individuals in <u>cases averted</u> (Year 3)	5865868.855
D4	Total cost per 100,000 individuals in <u>cases averted</u> (Year 4)	2663509.57
D5	Total cost per 100,000 individuals in <u>cases averted</u> (Year 5)	15447766.3
D6		22370767.8
D7		48464123.32
D8		30310657.75
D9		35533898.02
D10		137321630.8
D11		13745392.52
D12		209637886.1
D13		-8836045.84
D14		8823149.907
D15		42801143
D16		46136297
D17		50027310
D18		57253477

E1	Total cost per 100,000 individuals in <u>deaths averted</u> (Year 1)	42594126.64
E2	Total cost per 100,000 individuals in <u>deaths averted</u> (Year 2)	25571056.58
E3	Total cost per 100,000 individuals in <u>deaths averted</u> (Year 3)	11586306.88
E4	Total cost per 100,000 individuals in <u>deaths averted</u> (Year 4)	5260983.501
E5	Total cost per 100,000 individuals in <u>deaths averted</u> (Year 5)	30512540.49
E6		44186903.48
E7		95726689.34
E8		59869831.94
E9		70186814.15
E10		271238685.2
E11		27149999.42
E12		414078279.5
E13		-17453022.1
E14		17427549.95
E15		84541129.37
E16		91128749.84
E17		98814307.05
E18		113087484.7
F1	Total cost overall (Year 1) $= (D1 + E1) * A1 / 100,000$	64158509.79
F2	Total cost overall (Year 2) $= (D2 + E2) * A2 / 100,000$	38517068.28
F3	Total cost overall (Year 3) $= (D3 + E3) * A3 / 100,000$	17452175.74

F4	Total cost overall (Year 4) = (D4 + E4) * A4 / 100,000	7924493.071
F5	Total cost overall (Year 5) = (D5 + E5) * A5 / 100,000	45960306.79
F6		66557671.28
F7		144190812.7
F8		90180489.7
F9		105720712.2
F10		408560316
F11		40895391.94
F12		623716165.6
F13		-26289067.9
F14		26250699.86
F15		127342272.4
F16		137265046.8
F17		148841617.1
F18		170340961.7

3. Are there any delay in the benefits? Are the benefits realized the same year as the costs?

Explain. (no point)

The main delay is that the benefits materialize overtime. Health improvements, as well as education enrollment and maternal health, increase the investments in human capital for future generations that can't be quantified.

Budget impact analysis or benefit-cost analysis (10 points)

Governments and organizations care about the affordability and sustainability of interventions to ensure it will not require an amount of resources that would cripple the country's health system and economy. Two advanced economic evaluations are used for this purpose, one focusing on the impact on the budget over several years (Question 4), and one focused on the overall value of the investment (Question 5). You may choose to do either method (if you do both, you may earn 2 bonus points if done well).

4. Estimate the impact on the country's health budget. (10 points)

Online or on the World Bank data repository, find the most recent annual amount spent by the government on health (or budgeted for health) and report it below:

Table 4: Country annual budget.

	Country	Indonesia
G	Most recent annual budget (amount, \$/LCU)	11.1B
	Most recent annual budget (year)	2023

Using the table below or a new workbook in MS Excel (recommended to make graphs later), compute the impact on the budget for the intervention.

Table 5: Budget impact analysis.

	H	I	J	K	L
	Year	Target population size (A)	Total annual cost of the intervention (C)	Total annual benefit of the intervention (F)	Savings or costs (G - J + K)
1	2007	387,947	59319478.68	64158509.79	4839031.106
2	2008	620,848	35611993.15	38517068.28	2905075.136
3	2009	726,376	16135879.25	17452175.74	1316296.49
4	2010	774,293	7326803.558	7924493.071	597689.513
5	2011	1,052,201	42493839.83	45960306.79	3466466.957
6	2012	1,454,655	61537688.07	66557671.28	5019983.206
7	2013	2,326,533	133315500.4	144190812.7	10875312.25
8	2014	2,871,827	83378801.25	90180489.7	6801688.447
9	2015	3,511,088	97746932.6	105720712.2	7973779.573

10	2016	5,981,528	377745447	408560316	30814869.06
11	2017	6,228,810	37810936.36	40895391.94	3084455.583
12	2018	10,000,232	576673584.1	623716165.6	47042581.52
13	2019	9,841,270	-24306266	-26289067.9	-1982801.936
14	2020	10,000,000	24270791.76	26250699.86	1979908.099
15	2021	10,770,000	117737728.6	127342272.4	9604543.795
16	2022	11,600,000	126912097	137265046.8	10352949.81
17	2023	12,500,000	137615526.9	148841617.1	11226090.15
18	2024	13,530,000	157493325.2	170340961.7	12847636.51

If you can (optional), add years 6 – 10.

There seems to be a positive benefit in the budget! Although many of the benefits should be delayed given that the main benefits could of CCT is in human capital, and these decrease in visits should only translate after a few years. This is under the assumption that the benefit calculated in 2019 can be applied as early as 2018, so that is the greatest limitation.

5. Estimate the return-on-investment over 5 years, including a sensitivity analysis. (10 points)

If you did not have a gradual roll-out, simply multiply your average annual amounts by 5.

Average Cost: 114934449.3

Average Benefit: 124310313.5

Total Savings: 9375864.181

M	Total annual cost of the intervention over 18 (<i>sum of all C</i>)	114934449.3
N	Total annual benefit of the intervention over 18 years (<i>sum of all F</i>)	124310313.5
O	Total costs incurred or saved over 18 years ($N - M$)	9375864.181
P	Return on investment estimate over 18 years (N / M)	1.081575752 (8.1%)

Now, assume the costs may be 25% higher or lower, and the benefits may be 10% higher or lower, and report your estimations of the total costs incurred or saved (*O*) and the return on investment (*P*) below:

		Total costs incurred or saved over 18 years	Return on investment estimate over 5 years
Q	25% HIGHER total annual cost over 18 years	-19357748.1	-13.47%
R	25% LOWER total annual cost over 18 years	38109476.51	44.21%
S	10% HIGHER total annual benefit over 18 years	21806895.53	18.97%
T	10% LOWER total annual benefit over 18 years	-3055167.17	-2.66%
U	25% HIGHER total annual cost over 18 years + 10% HIGHER total annual benefit over 18 years	-6926716.8	-4.82%
V	25% HIGHER total annual cost over 18 years + 10% LOWER total annual benefit over 18 years	-31788779.5	-22.13%
W	25% LOWER total annual cost over 18 years + 10% HIGHER total annual benefit over 18 years	50540507.86	58.63%
Y	25% LOWER total annual cost over 18 years + 10% LOWER total annual benefit over 18 years	25678445.16	29.79%

SWOT analysis (5 points)

You will perform a Strengths Weaknesses Opportunity and Threat (SWOT) analysis to identify the endogenous and exogenous factors that will/may influence whether your intervention will be adopted and how it will be carried out. You can report each strength, weakness, etc. in brief point forms/bullets.

- **Strengths** (endogenous): What aspects of the program make it strong compared to other programs and interventions? (e.g., *no need for highly specialized labor, the program is generally perceived positively by the population*)
- **Opportunities** (exogenous): What elements in the environment or context can give an advantage to the program? (e.g., *increasingly aging population for a program focused on older adults*)
- **Weaknesses** (endogenous): What aspects of the program should be improved or monitored to avoid problems? What could be its disadvantages compared to similar programs? (e.g., *high reliance on a specialized workforce, expansive program to run, complex program requiring extensive coordination between agencies or healthcare providers*)
- **Threats** (exogenous): What factors could threaten the program's implementation and sustainability? (e.g., *lack of the necessary specialized workforce, lack of coordination between program staff and other professionals in the healthcare system*)

Table 6: SWOT analysis.

<p>STRENGTHS:</p> <ul style="list-style-type: none"> ▪ <u>No Need for Highly Specialized Labor:</u> Reliance on CHW's for compliance allows this to be extremely scalable and manageable, all it needs is communication ▪ <u>Proven Effectiveness:</u> Case studies in other studies exist! Which allowed me to make a lot of the comparisons that I needed to ▪ <u>Structured Hierarchy:</u> Clear roles and responsibilities among CHWs, facilitators, UPPKH officials, and supervisors ensure organized program delivery. ▪ 	<p>WEAKNESSES:</p> <ul style="list-style-type: none"> ▪ <u>High Operational Costs:</u> The program's extensive workforce and logistical needs (home visits, training, meetings) result in high costs. ▪ <u>Coordination Challenges:</u> Because the program hinges on communication, extensive project management work is necessary ▪ <u>Reliance on Accurate Targeting:</u> Data accuracy from Statistics Indoensia is crucial to identify households (that may have matriculated out of their income bracket. ▪ <u>Monitoring and Evaluation:</u> Longitudinal studies are hard due to high attrition, and it's difficult for households not to share wealth <p>NEED FOR AN information management system.</p>
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OPPORTUNITIES: <ul style="list-style-type: none">▪ <u>Government Support</u>: Strong commitment from the Indonesian government to reduce poverty and improve health outcomes provides a favorable policy environment.▪ <u>Tech Support</u>: Leveraging the MIS would allow other governments to also record, analyze, and present data▪ <u>International Funding and Partnerships</u>: Potential for support from international organizations and NGOs to strengthen program funding and implementation to supply CHW's would foster globalization	THREATS (PEG) <ul style="list-style-type: none">▪ <u>Geographic Barriers</u>: Remote or rural areas with poor infrastructure may hinder program reach and timely service delivery.▪ <u>Political & Cultural Barriers</u>: Because the ROI's really thin, shifts in the budget could drastically affect the perception of the cash transfers▪ <u>Health Crises and Pandemics</u>: Events like COVID-19 can disrupt program implementation, reduce household visits, and strain healthcare resources.
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Final deliverable (25 points)

Using your answers from all your assignments, you must create a final report that covers the following elements (use these elements as headings). A suggested page length is provided for single line spacing.

A. Objectives, design, implementation of the program (1/2 page)

Summarize your program, from its objectives to the target population and its activities, etc. You could use a separate text box to highlight the objectives.

B. Program effectiveness (1/2 page)

Summarize Assignment #1. You should present and describe the outcomes and effectiveness estimate(s) you used and cite the appropriate references.

C. Program costs (1 page)

Summarize Assignments #2 (except the activities: you can just provide costs per activity) and #5 (Q.1). Use tables to summarize the costs.

D. Societal costs (1 page)

Summarize Assignments #3 and #5 (Q.2) using tables, figures, icons, infographic: anything that helps communicate the “cost of doing nothing”. This section should call the reader to action.

E. Consumer demand (1/4 page)

Briefly describe (1) whether there is a risk the demand for the program does not meet expectations, and (2) whether it would be possible to add user fees using Assignment #4 (Q.1-3 only). You may add recommendations to stimulate consumer demand if necessary. You do not need to use Q.4.

F. Comparison with similar programs (1/2 page)

Insert your SWOT analysis from Assignment #5. Provide any additional comment you feel relevant about existing programs.

G. Affordability and sustainability (1/2 page)

Use your findings from Assignment #5 to talk about the program’s affordability and sustainability. Is it expensive? How does it compare to the country’s budget? Is it adding an additional cost or saving money? You should add a brief paragraph about potential avenues for financing this intervention (refer to the financing lecture to use the correct vocabulary).

H. Relevance to the local context (1/4 page)

Briefly describe the health system where the intervention will be rolled out: is it decentralized? Is there national health insurance? Is the private sector the main provider of healthcare?

I. Social impact (1/4 page)

If the program is expected to have an impact on equity or equality, add a brief paragraph describing this. If not, simply state that your program is expected to [cite objective] and not have a significant impact on access to healthcare [or something similar, depending on your program].