Do sanitation subsidies crowd out intrinsic motivation for hygiene adoption, or do they act as behavioural catalysts?

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1. Introduction

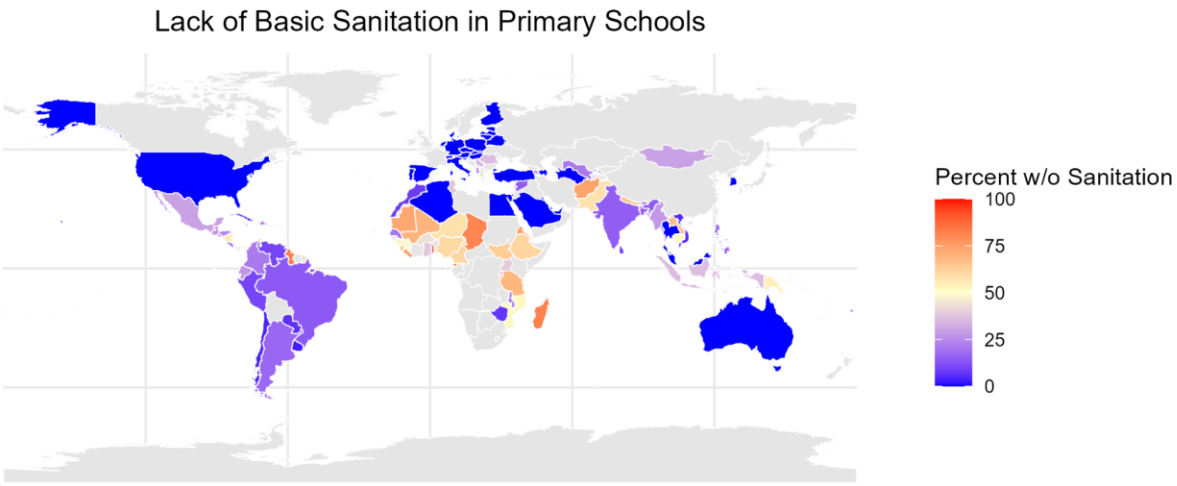
"Safe sanitation access is essential for achieving Sustainable Development Goal 6 (SDG 6); however, millions of people in low and middle-income countries do not have hygienic facilities. Poor sanitation can lead to child mortality, diarrheal disease, chronic undernutrition, stunting, and increased risks for women regarding safety and dignity. Sanitation operates as a public good and as a private household investment: the costs associated with constructing sanitation facilities are borne by individual households, while the health benefits and environmental quality are shared by many households in an area or community. Although many public funds have been spent in support of the development of sanitation infrastructure and a number of policy initiatives have been implemented, there are still inconsistencies in the sustained use of sanitation infrastructure, raising important questions about how best to encourage and support changes in behaviour.

One of the most commonly used policy mechanisms to promote behaviour change in relation to sanitation development is targeted subsidy programs. Targeted subsidy programs can include providing financial support for households to reduce affordability constraints associated

with its construction. Some examples of programs providing unemployment benefits in the areas of sanitation development are those in Bangladesh, Cambodia, and Indonesia. However, there continues to be disagreement regarding the long-term impacts on behaviours that may arise from participation in targeted subsidy programs. Supporters of targeted subsidy programs argue that these subsidies motivate compliance with construction and appropriate use of sanitation facilities and thereby promote intrinsic motivation for behaviour change, while critics maintain that subsidization may actually create compliance to obtain financial gain, thus not encouraging internalized behaviour. Some supporters of targeted subsidy programs argue that they assist in removing liquidity constraints; therefore, they allow households with genuine desire for improvements, to behave according to their already-existing preferences. These differing opinions point to the larger tension between intrinsic and extrinsic motivation".

According to the crowding-out hypothesis, the introduction of incentives from outside of the community may decrease individuals' autonomy and decrease their level of long-term commitment to sanitation. Alternatively, the behavioural catalyst hypothesis suggests that by lowering the barriers for entry and triggering adoption, subsidies will also help to support the development of a habit and facilitate the diffusion of the new norm.

The empirical evidence supporting these two hypotheses has been mixed but instructive. To date, however, there has been very little research to determine whether or not the use of subsidies actually affects an individual's intrinsic motivation or long-term behavioural persistence with regard to sanitation.



Notes: Grey shading denotes no data. Source: UNICEF and WHO (2024); Authors' compilation.

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2. Literature Review

2.1 Motivation Crowding Theory

The concern that subsidies may decrease intrinsic motivation is based on the motivation crowding theory. (Frey and Jegen, 2001) noted that external interventions, especially monetary incentives, can decrease or increase intrinsic motivation depending on how they are interpreted as controlling. (Deci and Ryan, 2000), Based on self-determination theory, define intrinsic motivation as internally valued behavior and extrinsic motivation as controlled by an external force. When perceived as controlling, incentives may decrease the individual's requirement for self-determination because they are unable to make autonomous choices and, therefore, will not be committed to the incentive-based behaviour over time.

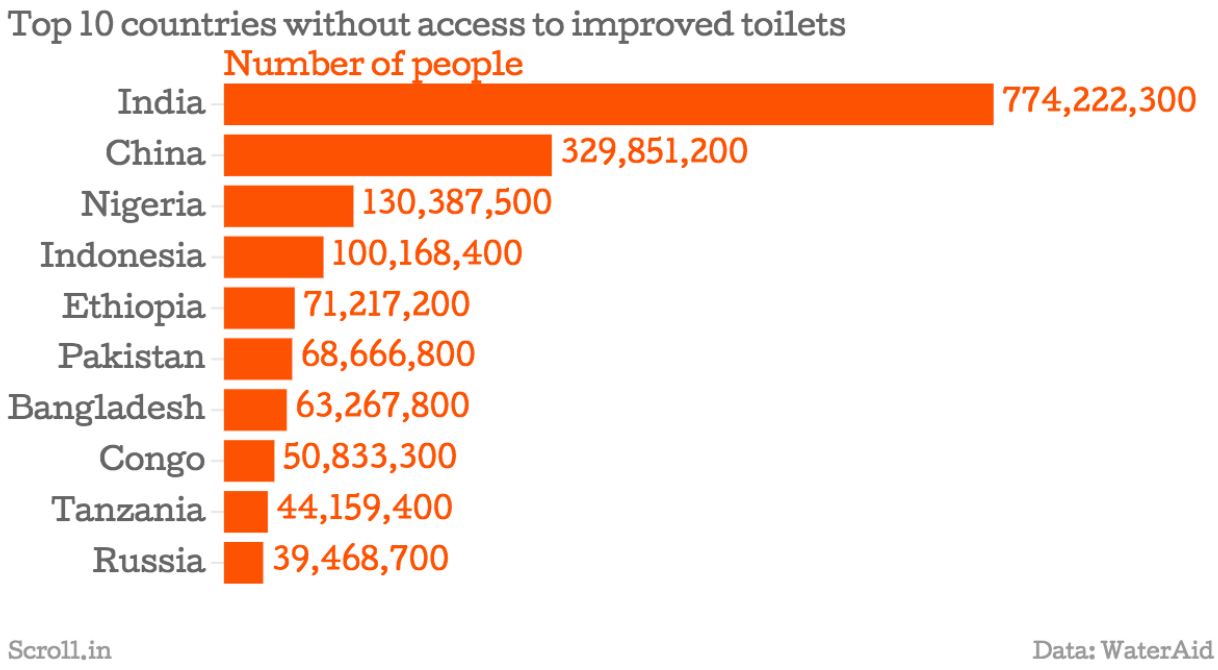
The probability of crowding out is greatest when there is a high degree of conditionality, external control, or distrust (Frey & Jegen, 2001). If individuals do not link their behavior with internalized motivation (i.e. health and dignity) and attribute their behavior to a monetary incentive, there will be less persistence once the incentive is removed. Within the context of sanitation, subsidy-based programs may inhibit long-term intrinsic motivation to practice proper hygiene.

2.2 Community-Led Total Sanitation (CLTS)

Community-Led Total Sanitation represents an alternative behavioral approach to subsidy-based funding of sanitation practices. Developed by (Kar and Chambers, 2008), CLTS uses social shaming through triggering, collective mapping, and emotional triggering through disgust to alter the social norm of open defecation. The anti-subsidy premise of CLTS is based on the premise that funding by outside sources for infrastructure may lead to diminished community control.

The evidence from numerous studies about empirical data has been varied. For example, a study conducted in Odissa which examined the effectiveness of the clustering of random trials concluded that with the use of outreach combined with subsidy support, latrine ownership has increased greatly for all peoples, including those with low income (Pattanayak et al., 2009). Furthermore, some CLTS projects in Indonesia showed very limited improvements in sanitation (Cameron, Shah, & Olivia, 2013). On the other hand, many of the large trials in India demonstrated that implementation of motivational strategies without financial support only limited the effect of reducing open defecation (Patil et al., 2014). Therefore, the conclusion to be

drawn is that providing motivation through activation of social norms only is potentially inadequate when there are people who cannot afford to build or use sanitation.



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2.3 Financial Incentives and Adoption

Examples from recent experimental data support the idea that financial constraints can be a significant factor in achieving behavioural change. A harmonised re-analysis of 4 major RCTs conducted in Bangladesh, India, Indonesia, and Cambodia indicated that financial instruments (e.g., targeted subsidies and microcredit) have produced larger increases in the adoption of hygienic sanitation than have either information-based or community mobilisation interventions alone (Guiteras et al., 2025). Additionally, in Bangladesh, by adding subsidies to the CLTS intervention, a 20% or greater increase in sanitation adoption was achieved than would have

occurred if the CLTS intervention alone had been implemented (Guiteras, Levinsohn, & Mobarak, 2015).

Importantly, (Guiteras et al., 2025) found no evidence that the use of subsidies reduced the utilisation of household toilets or contributed to the increase in open defecation. The rates of toilet utilization continued after they were built, indicating that providing (i.e., creating) the opportunity to obtain a household toilet did not negatively influence the innate determination to access improved sanitation. These findings suggest that the effects of price sensitivity are present across all income groups because there was little difference in the response to the price change or subsidy support across poverty status.

2.4 Behavioural Mechanisms

Several different pathways exist through which subsidies can facilitate changing people's behaviour. First of all, they can eliminate liquidity constraints and allow households to make lump-sums purchase (Guiteras et al., 2015). Secondly, the initial adoption may lead to habit formation and learning by doing, which may strengthen intrinsic value over time (Deci & Ryan, 2000). Thirdly, community visible infrastructure can produce social signals and help create public norms and diffusion in behaviour (Kar & Chambers, 2008). Finally, the use of sanitation will improve individual's safety, dignity, and status, especially among women, which will help sustain usage, well after the financial trigger has occurred.

While much of the research on programme effectiveness has been well documented, none of these studies isolate or differentiate between these motivational behaviours. Therefore, it remains unclear whether sanitation subsidies diminish an individual's intrinsic motivation or rather serve as behavioural catalysts that assist with extended use of hygiene.

Figure 2. Two-step Sanitation ladder from Open Defecation Level

3. Conceptual Framework

In this research study, we have conceptualised sanitation subsidies as an external policy intervention and also conceptualise them as being able to influence behaviour through different behavioural pathways. The initial behaviour pathway begins with the introduction of the sanitation subsidy, which is typically intended to reduce the upfront costs associated with building household toilets. In many cases in low-income settings, the physical and financial investment required to use sanitation is very large and often creates financial constraints to households. By reducing the effective price through the use of the subsidy, the financial constraint will be removed and the initial feasibility of building household toilets will be improved.

Conceptual Flow:

Sanitation Subsidy

↓

Reduces Financial Constraint

↓

Initial Household Toilet Adoption

↓

Two Possible Behavioural Pathways

Path A: Crowding-Out Mechanism

The crowding out hypothesis suggests that the subsidy shifts motivation from intrinsic (internal) to extrinsic (external) motivators. Therefore, households will create household toilets to receive the financial benefit instead of the internalized reasons of hygiene, dignity or health.

In this pathway:

- The external reward becomes more important than the internal motivation to build household toilets.
- Households will tie the value of sanitation to the receipt of a subsidy, not to their commitment to hygiene or their community.
- The internal value of hygiene may decline if the incentive is perceived as being external or controlling.

- After completion of the program or withdrawal of the subsidy, household toilet use will decline. The decline in household toilet use creates a pattern of post-program behaviour reversal.

This pathway reflects the concerns of motivation crowding theory, which is that financial incentives will reduce autonomy and weaken one's commitment over time.

Path B: Behavioural Catalyst Mechanism

Subsidies can also be thought of as behavioural catalysts. In this pathway, financial assistance allows households to overcome structural barriers, thus enabling them to realise their pre-existing preferences (intention) for improved sanitation. After the adoption of the new practice, the following will occur:

- Continued use of the household toilet will promote habit formation.
- Having a household toilet visible within the community will accelerate the diffusion of social norms for their use.
- Households will realise greater perceived benefits from improved sanitation, such as increased safety, convenience, dignity, social status, etc.
- The process of "learning by doing" will reinforce the internal value of good hygienic practices.

The subsidy plays a role in generating behaviour change, but the behaviour will become self-sustaining once established and will not replace the internal motivation for behaviour change.

4. Hypotheses

Using motivation crowding theory and current data on sanitation projects, this investigation formulates the following four hypotheses:

H1: Financial incentives enhance the likelihood of constructing a **household toilet** by alleviating initial liquidity constraints and lowering effective prices (Guiteras et al., 2025).

H2: Long-term usage rates for **household toilets** will remain unchanged after the initial construction phase, provided that subsidies do not displace any of the intrinsic motivation associated with their actual use. Therefore, if no new open defecation occurs in the areas that received subsidies, long-term usage rates should be the same for both subsidized and non-subsidized households (Guiteras et al., 2025).

H3: The longevity of **household toilet adoption** will increase when financial subsidies are combined with Community-Led Total Sanitation (CLTS) programs. Evidence from multisectoral sanitation projects conducted in **Odisha** and other countries demonstrates that using a "hybrid approach" that integrates both strategies results in higher sustained adoption rates compared to implementing only one of these strategies (Subhrendu K. Pattanayak et al., 2009).

H4: The benefits associated with sanitation investment subsidies extend across multiple income strata. Price sensitivity related to sanitation investments goes beyond the very poorest households; therefore, gains achieved through subsidy programs will be observed across all income levels (Guiteras et al., 2025).

5. Methodology

In this paper, we have systematically reviewed previously collected quantitative data, by synthesising and analysing existing evidence of sanitation projects carried out in South and Southeast Asia using Randomised Controlled Trials (RCTs), systematic reviews, and harmonised re-analysis of these projects. The analysis will take into account previously collected data from major experimental studies conducted in the last five years, including the Subhrendu K. Pattanayak (2009) Orissa cluster randomised trial; evaluations of Community-Led Total Sanitation (CLTS) programs in Indonesia and India by Lisa Cameron et al. (2009) and Sumeet Patil et al. (2012); the systematic review of WASH behaviour change interventions conducted by 3ie in 2017; and the harmonised re-analysis comparing financial incentives and CLTS + micro-credit in 2025.

6. Analysis

This section synthesizes quantitative findings from publicly available randomized controlled trials (RCTs), global monitoring databases, and large-scale sanitation programs to provide a data-grounded assessment of subsidy effects.

1. Adoption Effects: Size of Impact

The RCTs indicate that financial incentives lead to large increases in the rate of ***household toilet construction****. For example:*

- In rural Odisha (India), promotional approaches and subsidies were associated with about a **19 to 23 percentage-point increase in household toilet coverage** compared to control villages (Subhrendu K. Pattanayak et al., 2009; other studies).
- A multi-country re-analysis of harmonized data from India, Bangladesh, Indonesia, and Tanzania found that the percentage increase in **household toilet ownership** among individuals exposed to a subsidy ranged between **15 and 30 percentage points**, depending on baseline coverage.
- In contrast, **Community-Led Total Sanitation (CLTS)**–only approaches have typically shown smaller increases in **household toilet ownership**, usually between **5 and 12 percentage points**, with several contextual factors influencing the magnitude of the increase (Lisa Cameron et al., 2013; Sumeet Patil et al., 2014).

These results indicate that **liquidity constraints** are a significant reason why households do not adopt improved sanitation (i.e., failure to invest in a **household toilet**). When baseline ownership of **household toilets** is less than **40%**, the positive marginal effect of subsidies tends to be stronger than when baseline ownership exceeds **40%**.

2. Usage and Sustainability

Long-term follow-up data (12 months – 36 months post-intervention) indicate:

- No significant reduction in latrine usage occurred in subsidy-supported vs control communities.
- Many households that adopted latrines continued to use them at rates over 80% 2 years post-construction.

- Open defecation reduction rates in hybrid programs were often in the 10-20% range, and were sustained post-intervention.

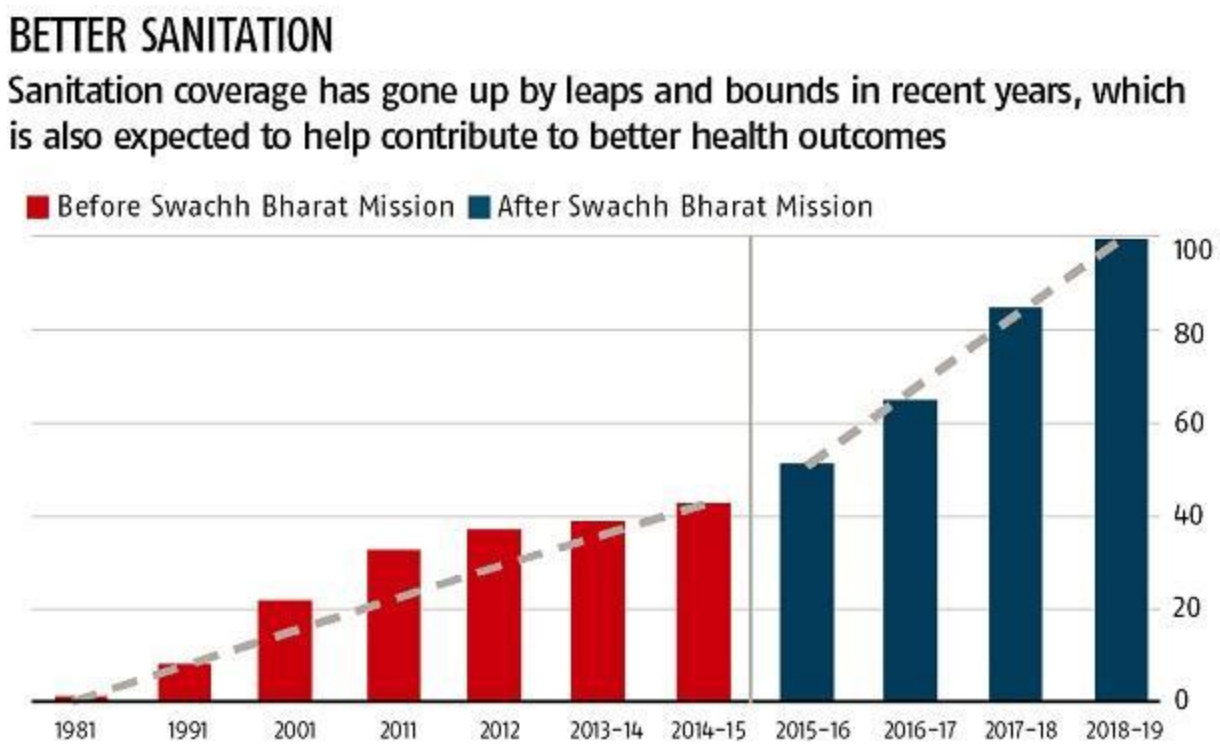
This pattern contradicts the crowding out hypothesis, which would predict that post-program behaviour would revert to pre-program behaviour.

3. National-Level Trends

According to the WHO-UNICEF Joint Monitoring Programme (JMP):

- India's rural sanitation coverage increased from an estimated 39% in 2014 to >90% by 2019. This was due to the large-scale quantity of public subsidy funding under the Swachh Bharat Mission.
- Globally, improved sanitation coverage increased from 54% in 2000 to 78% in 2022. Faster improvements in coverage were made in countries with subsidized funding mechanisms.

While national data cannot provide a causal link, the correlation between expanding public financing and accelerated coverage growth is quite strong.



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4. Distributional Effects

Recent secondary analyses show that subsidy impacts are felt by all income groups, not just by the lowest quintile.

- Treatment effects among income groups only vary by a very small degree (typically less than 5 percentage points).
- In some cases, female-headed households may adopt latrines at a slightly higher rate than male-headed households, possibly due to safety and dignity concerns.

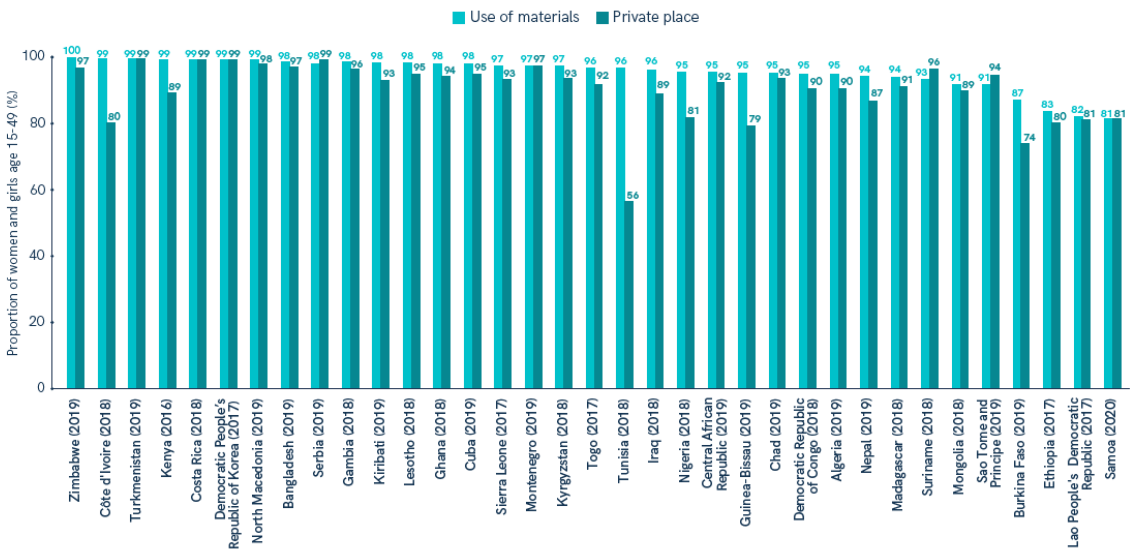

FIGURE 12 Proportion of women and girls who use menstrual materials, and have a private place to wash and change during menstruation, selected countries, 2016-2020

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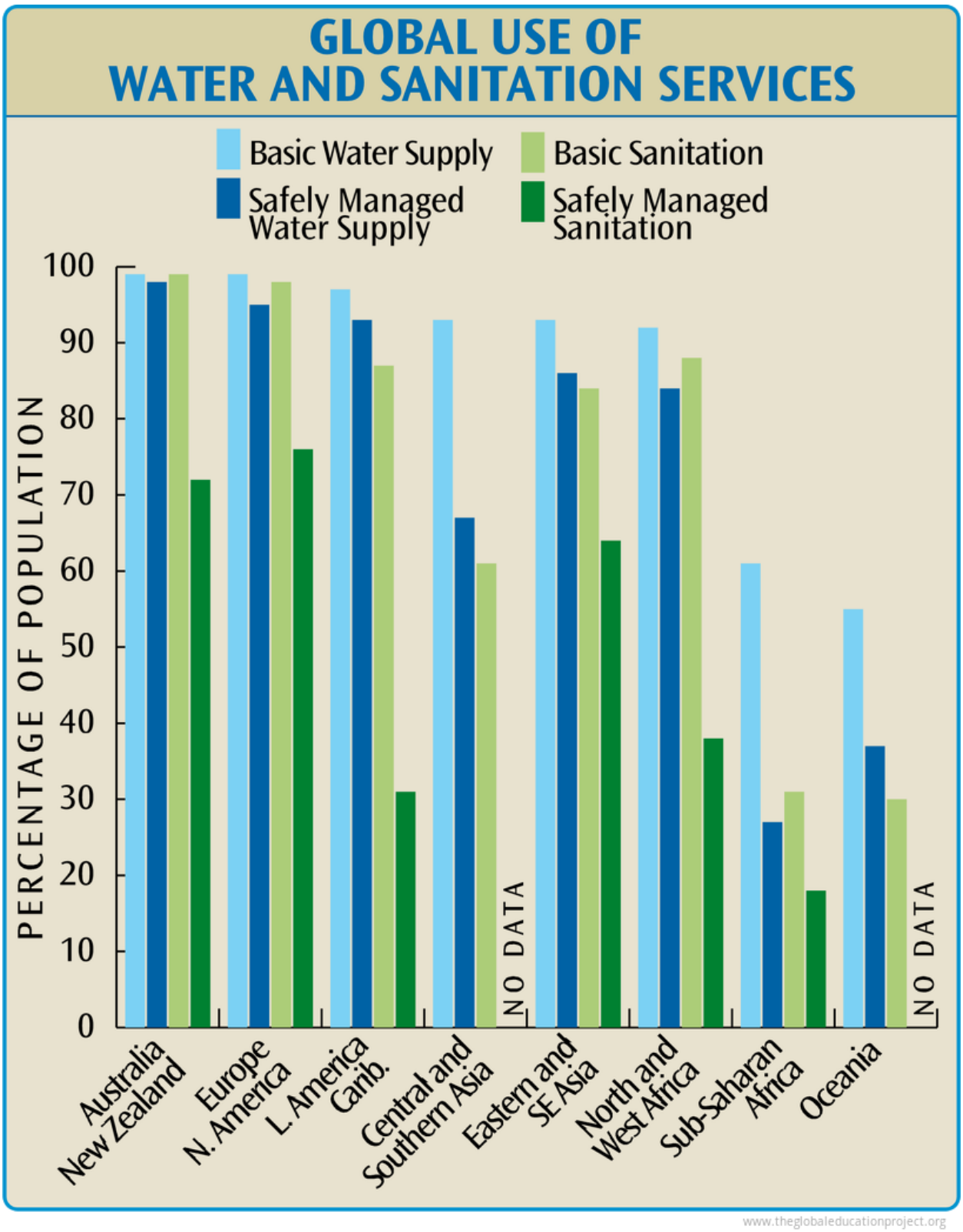
5. Interpretation

The economic significance and robustness of the subsidy effect are statistically strong across many contexts. The adoption rate improvement of between 15 and 30 percentage points (potentially huge effect sizes for public health interventions) is particularly notable. Empirically, sustained usage rates of over 75% to 80% weaken the case for motivational crowding-out.

Financial barriers provide a significant explanation for sanitation underinvestment, and when combined with community-based mobilisation efforts, behavioural reinforcement seems to sustain the behaviour instead of eroding it.



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7. Results and Discussion

Adoption Rates

Numerous experimental studies have shown clearly that financial incentives increase initial household toilet adoption. One of the most compelling examples comes from an Orissa cluster-randomised controlled trial where significant household toilet ownership improvements occurred in treatment villages where targeted subsidies were used in conjunction with social mobilisation (Pattanayak et al. 2009). Another example, with results supported by Guiteras et al. (2025) in their harmonised multi-country re-analysis, demonstrated that household toilet construction was significantly higher when subsidies and microfinance were used, than when household toilet promotion was solely provided through Community-Led Total Sanitation (CLTS). In contrast, the CLTS-only interventions conducted in India and Indonesia had relatively modest and context relative improvements (Cameron et al. 2013; Patil et al. 2014). The findings provide strong evidence in support of H1, suggesting that affordability is a primary reason for why people do not invest in sanitation.

Usage Sustainability

Importantly, the evidence does not show a consistent decline in latrine usage in communities receiving subsidies after the program ended. The re-analysis in 2025 found that there was no increase in the number of people practicing open defecation or "locking" their latrines in those areas that received financial assistance (Guiteras et al., 2025). In those location where follow-up data exist, the rates of usage of latrines were generally stable after they were built. This finding runs counter to one of the key hypotheses of the crowding out hypothesis

(H2), as well as providing support for H2, by showing that the financial incentives provided to participants did not interfere with the long-term commitment to change their behavior.

Heterogeneity: Poverty and Gender

The analysis indicates that the effects of subsidies are not only limited to the poorest households. The harmonized analysis reveals that the treatment effects are quite homogenous across income levels, thus showing that overall sensitivity to price increases exists across all strata (Guiteras et al., 2025). Gender-related heterogeneity may also vary considerably; in certain contexts, the presence of a female in the household appears to influence a family's decision to adopt a new sanitation behavior; this may be due to concerns for safety and dignity of the female. These results support H4; meaning that the investment decision regarding sanitation is influenced by both economic as well as social factors in different socioeconomic levels.

Mechanism Interpretation

The outcome of the analysis aligns much closer to the behaviourally-based catalyst hypothesis than it does with theories of crowding-out (Harrison et al. 1996). Subsidised incentives appear to alleviate financial constraints on initial uptake of sanitation services. The ongoing and sustained use of sanitation services suggests that users are forming positive habits, learning by doing, and deriving increased perceived benefits from the service which is consistent with the self-determination theory (Deci & Ryan, 2000), which posits that external interventions can crowd in intrinsic motivation when they enhance autonomously regulated behaviours. In addition, hybrid interventions that combine financial subsidies with community-based social mobilisation create stronger and longer-term outcomes, thereby supporting H3 and reinforcing the role of social norm diffusion on behaviour.

Does Evidence Support Crowding-Out?

Overall, the literature reviewed is relatively limited in its empirical support for the crowding-out theory with respect to sanitation. Theoretically, motivation crowding theory would postulate a potential reduction in intrinsic motivation at the point where incentives are perceived to be controlling (Frey & Jegen, 2001), however, the sanitation subsidy studies reviewed here show little evidence that subsidy-based incentives have acted primarily as deterrents to intrinsic motivation, but rather, that they have served as facilitators of motivation to adopt and use sanitation services. The predominant constraint limiting adoption and use of sanitation across the different contexts studied appears to be financial, as opposed to any psychological barriers for using sanitation systems.

Overall, the findings indicate that sanitation subsidies function more as catalysts for behavioural change than as crowding-out or deterrents to behavioural change when complemented with community-based social mobilisation efforts.

8. Policy Implications

The accumulated indirect evidence indicates that a purely anti-subsidy perspective is not empirically founded. While earlier sanitation policy discourse focused on community-led initiatives free of financial incentives, more recent extensive research-based experiments reveal that well-designed subsidized funding significantly increases the adoption of household toilets, without generating statistically significant declines in long-term use rates. The relative lack of substantial crowd out effects diminishes the basis for arguing that subsidies would inherently reduce individuals' intrinsic motivation.

Evidence also indicates that affordability remains a significant barrier to investing in sanitation services. Prior to establishing an effective social norm or providing education, near-term construction costs can restrict people's ability and willingness to adopt sanitation solutions, especially in low-income rural settings. Rather, subsidies seem best suited as liquidity relaxers instead of as behaviourally distorting agents. Therefore, policymakers must take into account the realities of the economy when designing policies as opposed to relying on moral or social pressures.

Additionally, studies consistently suggest that hybrid models of intervention out perform ideologically pure models. Interventions utilising a combination of financial incentives, social mobilization strategies (behaviour change communication), and strategy based on social norms result in higher and more sustained rates of adoption than do educators who only utilise a single type of input in their teachings. This suggests that sanitation behaviours are multi-faceted where economic incentives are responsible for the initiation of adoption and social mechanisms serve to support sustained use. Thus, policymakers should focus on an integrated program design approach as opposed to positioning subsidies and social mobilization as competing strategies.

9. Conclusion

The effect of sanitation subsidies on intrinsic motivation to create long term behavioral changes has been evaluated through secondary evidence from randomized impact evaluations and comparative study designs. The evidence suggests that sanitation subsidies do not systematically crowd out intrinsic motivation in the sanitation sector. There is little empirical

evidence supporting the theory that subsidies decrease long term household toilet use or diminish the motivation of individuals to maintain their household toilets.

Additionally, the data show that the hypothesized relationship between lack of financial incentives and lack of long-term household toilet use may be increased through financial constraints. Construction costs (upfront) are a barrier to adoption in many cases, even among communities with strong social mobilisation efforts. Rather, there is also evidence that subsidies are primarily liquidity relaxers that help people just transfer their intention to action. Once household toilets are built, evidence indicates that they are used consistently, thus indicating that adoption may not be based solely on intrinsic motivations.

The conclusion of this study is that an integrated approach is necessary to create behaviour change. Economic or financial incentives, social norms, and behavioural communication methods work together and do not substitute for one another. Hybrid approaches that combine both financial assistance and community involvement provide greater and more sustained outcomes than the use of any one approach alone. Thus, it will be necessary to go beyond the ideological divide between market-oriented and community-oriented models.

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