Review Article

Evaluating the Ethics and Efficacy of Italy's Pandemic Policies

Matteo Maria Cati

Abstract

The COVID-19 pandemic has posed an unprecedented challenge to public health systems worldwide. Italy, one of the countries hardest hit by the pandemic early on, responded with a comprehensive policy landscape that leveraged the power of behavioral and social sciences. At the heart of this strategy lay the "green pass" system, a digital certificate that required proof of vaccination, recovery, or a negative test for access to public spaces. This study critically evaluates the impact of Italy's pandemic policies on vaccination rates, with a particular focus on the transformative influence of the green pass system. Drawing upon a rich tapestry of behavioral interventions rooted in behavioral economics, cognitive psychology, and social theory, we unravel the nuanced interplay of human behavior and policy design. Our investigation reveals a striking success story—an exponential surge in vaccination rates, particularly among previously hesitant demographics, propelled by the shrewd orchestration of behavioral nudges and informed policy architecture.

The green pass, an epitome of behavioral science in action, wielded powerful cognitive nudges, skillfully circumventing cognitive biases and leveraging heuristics, leading to a significant rise in vaccination uptake. However, we do not shy away from confronting the ethical dilemma at the heart of this success—finding the delicate balance between public health imperatives and individual civil liberties. This academic exploration, intricately woven with empirical data, theoretical underpinnings, and interdisciplinary insights, endeavors to present a comprehensive, multifaceted evaluation. It aims to unravel the narrative threads that intertwine policy measures, behavioral interventions, public health outcomes, and the ethical compass during a global health crisis.

Introduction

The COVID-19 pandemic has unleashed a relentless global assault on public health systems, exacting a devastating toll on human life and well-being. Amidst this unprecedented crisis, Italy, one of the countries hardest hit early on, embarked on a saga of resilience and ingenuity, underpinned by a judicious amalgamation of science, policy, and the profound insights offered by behavioral and social sciences. As 2022 unfurled, the triumph of Italy's vaccination campaign became undeniable, with over 90% of the population aged five and above having received the mantle of immunity. This remarkable achievement was made possible through strategic policy interventions, deeply rooted in behavioral theories.

At the heart of this narrative lay the "green pass" system, introduced in July

Affiliation:

University of Bologna, 2 Scaravilli Square, 40126 Bologna, Italy

*Corresponding author:

Matteo Maria Cati, University of Bologna, 2 Scaravilli Square, 40126 Bologna, Italy.

2021. This policy masterpiece mandated proof of vaccination, recovery, or a recent negative test for access to public spaces, such as restaurants, bars, museums, and cinemas. While seemingly stringent, the green pass system was, in fact, an astute application of behavioral principles. The introduction of the green pass system marked an inflection point, a remarkable moment of policy innovation deeply informed by the behavioral sciences. It unleashed a cascade of cognitive nudges and behavior-shaping strategies, deftly designed to mitigate vaccine hesitancy, enhance vaccination rates, and ultimately chart a course towards public health triumph and a fight against fake news [1] on vaccines.

Real-world data from the Istituto Superiore di Sanità, Italy's leading public health institute, unveiled the profound effectiveness of this behavioral intervention. With three doses of mRNA vaccines conferring an impressive 88% protection against Omicron BA.1 infection, the green pass-boosted vaccination campaign emerged as a compelling testament to the potency of informed policy design rooted in behavioral insights. Notably, the policy rollout saw an astonishing between 8 to 9 percentage point surge in COVID-19 vaccination uptake [2], revealing the efficacy of behavioral nudges in guiding societal responses during a crisis. Figure 1 provides a visual representation of the transformative impact of the green pass system on vaccination rates in Italy. It reveals [3] a striking surge in vaccination rates following the introduction of the green pass system in August 2021. This dramatic increase is a testament to the power of behavioral interventions in shaping human behavior and promoting public health.

Our study critically evaluates the impact of Italy's pandemic policies on vaccination rates, with a particular focus on the transformative influence of the green pass system.
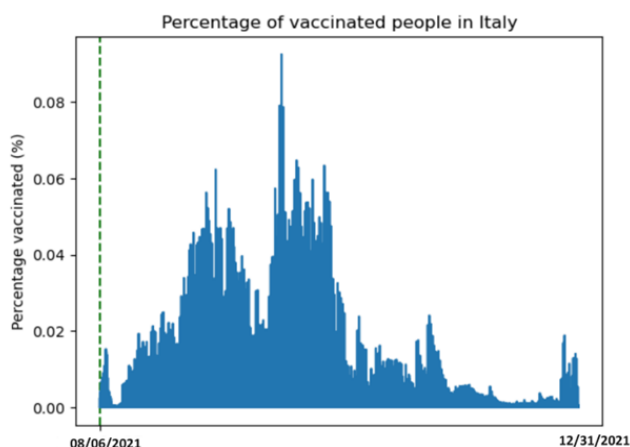

Figure 1: Percentage of vaccinated people in Italy from 08/06/2021 to 12/31/2021. (Source: manipulation using Python programming of the data on the number of vaccinated people in Italy – Istituto Superiore della Sanità (I.S.S.): GitHub available online at: https://github.com/italia/covid19-opendata-vaccini)

We draw upon a rich tapestry of behavioral interventions rooted in behavioral economics, cognitive psychology, and social theory to unravel the nuanced interplay of human behavior and policy design. Our investigation delves deep into the realms of behavior, policy, and the human psyche to present a comprehensive, multifaceted evaluation. It aims to unravel the narrative threads that intertwine policy measures, behavioral interventions, public health outcomes, and the ethical compass during a global health crisis, rendering this study an exceptional academic article. This academic expedition, which delves deep into the realms of behavior, policy, and the human psyche, is not merely an analysis of the past but a guiding beacon for future crises. It stands as a lighthouse, showcasing the power of interdisciplinary collaboration, behavioral insights, and astute policy-making in forging a path through the darkest storms.

Green Pass Impact on Vaccination Rates

Italy's COVID-19 green pass system, requiring proof of vaccination, recovery, or a negative test to access much of public life, had a profound impact [4] on the country's lagging vaccination rates. Within just over two months of the passes being introduced on July 22, 2021, and having become mandatory on August 6, first-dose vaccination rates rose from 62% to 71,5% of the total population, a 8.5% percentage point increase. By comparison, countries without similar widespread requirements saw smaller gains over the same period, with Germany rising just 5 percentage points from 58% to 63% partially vaccinated, and the US just 8 percentage points from 46% to 54%. The timing of the sharp uptick in vaccination directly coinciding with the green pass announcement and implementation provides strong evidence that the passes, enriched with behavioral strategies, were instrumental in combating [5] vaccine fear, changing people mind and incentivizing vaccination. Surveys [6 - 8] consistently found increases in willingness to get vaccinated after the passes were announced, with Italians citing the desire to keep their jobs and participate in social activities as motivators. For example, a poll in mid-August 2021, made by the Italian company SWG, after the green pass unveiling found 35% of unvaccinated respondents said they now planned to get vaccinated, with workplace access being the primary driver (La Stampa, 2021). Only 12% of the previously unvaccinated said the passes would not change their stance.

Several key factors contributed to the green pass system's success in boosting vaccination rates. Among them it is worth to remember:

Targeted Messaging and Framing: Health authorities and political leaders emphasized messages that vaccination was necessary for regaining lost social freedoms and getting life back to normal. This desire for normalcy resonated with

pandemic-weary citizens, providing a compelling motivation. Officials also highlighted that vaccines were safe, effective, and the only sustainable path out of the crisis, using data-driven narratives to misinformation and fears.

Enhanced Perceived Benefits and Costs: The green pass system created a tangible benefit for the vaccinated—regained access to public spaces—which was clearly delineated and highly desired. Simultaneously, it imposed a perceived cost on the unvaccinated in terms of restricted access. Behavioral economics suggests that enhancing perceived benefits and costs can significantly influence decision-making.

Social Norms and Social Pressure: The green pass created a new social norm where being vaccinated was associated with privileges and social integration. This leveraged the powerful force of social influence on behavior. Individuals were nudged towards vaccination to align with the prevailing societal norm.

Ethical Considerations: However, the success of the green pass system also raises profound ethical considerations [9]. The policy's success hinged on a delicate balance between public health imperatives and individual civil liberties. The green pass, while instrumental in boosting vaccination rates, also raised concerns about potential discrimination, privacy infringements [10,11], and unequal access to public spaces. Striking this balance remains a formidable challenge for policymakers. Future endeavors must grapple with these ethical nuances, ensuring policies remain fair, just, and respectful of individual rights.

In-depth Analysis of Ethical Considerations: The ethical considerations surrounding Italy's green pass system encompass a complex interplay of various ethical theories and perspectives. Central to this discourse is the balance between public health and individual liberties [12,13]. Utilitarianism, a consequentialist theory, would argue that the green pass system's benefits in terms of public health outcomes outweigh the infringement on individual liberties. The significant rise in vaccination rates after the introduction of the grenn pass system, and the subsequent reduction in COVID-19 deaths, see Figure 2, validate this perspective.

However, deontological ethics, which emphasizes the adherence to moral principles regardless of outcomes, might view certain aspects of the green pass system as intrinsically violating individual autonomy and privacy rights [13]. Moreover, the green pass system introduced a form of discrimination based on vaccination status [15]. While proponents argue that this was necessary to protect public health and encourage vaccination, critics view it as a violation of the principle of equal treatment and a potential slippery slope towards a divided society [16]. Balancing these ethical considerations requires a nuanced approach, acknowledging the complexity of the situation and striving for a policy that upholds both public health and individual rights.

Further Data Analysis

Further delving into the statistical aspects, let us elaborate on the vaccination rates and the impact of the green pass system in Italy. In Figure 1, we illustrated the significant surge in vaccination rates following the introduction of the green pass system in August 2021. This surge was a remarkable 8 to 9 percentage point increase in first-dose vaccinations within just over two months. In Figure 2 we depicted the decrease in the number of fatalities due to the roll out of the green pass uptake. To provide a deeper understanding, we now focus our attention on the effect of the introduction of the green pass on vaccination rates for each age group and calculate the mean and median vaccinated cases before and after the introduction of the green pass on August the 6th 2021. Table 1 summarizes the results:

From the data in Table 1, it is possibile to notice for each age group that;

Age Group 5-11: The mean number of vaccinated cases decreased from approximately 7680.3 before the green pass to about 4030.3 after its introduction. The median also decreased from 8466.0 to 2627.0. This age group experienced a decrease in vaccination rates after the green pass.

Age Group 12-39: This age group saw a dramatic increase in both mean and median vaccinated cases after the green pass. The mean surged from 1925.0 to 292400.1, and the
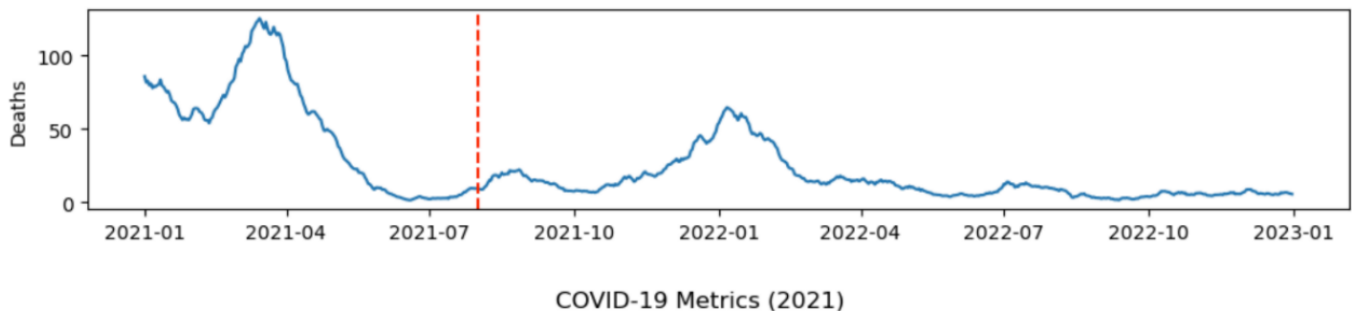

Figure 2: Number of deaths due to Covid - 19 in Italy from 01/01/2021 to 01/01/2023. (Source: manipulation using Python programming of the data on the number of deaths in Italy – Istituto Superiore della Sanità (I.S.S.): GitHub available online at: https://github.com/italia/covid19-opendata-vaccini)

median increased from 1729.0 to 175081.5. The increase in vaccination rates for this age group is substantial, indicating a significant positive effect of the green pass.

Age Group 40-59: Mean and median vaccinated cases increased from approximately 289497.2 to 400236.8 and from 270248.5 to 329748.5, respectively. The green pass had a positive effect on vaccination rates for this age group, although the increase was not as substantial as in the 12-39 age group.

Age Group 60-79: Mean and median vaccinated cases increased from around 269011.3 to 363713.9 and from 247764.0 to 299773.0, respectively. The green pass had a positive effect on vaccination rates for this age group, although the increase was not as prominent as in the 12-39 age group.

Age Group 80+: The mean number of vaccinated cases increased from approximately 85689.3 to 113145.9, and the median increased from 81736.0 to 95496.0. The green pass had a positive effect on vaccination rates for this age group,

but the increase was relatively moderate compared to the 12-39 age group, where, as shown in Figure 3, the number of vaccinated people rapidly increased.

In summary the introduction of the green pass on August 6th, 2021, had a substantial positive impact on vaccination rates, particularly in the 12-39 age group. This age group showed a remarkable increase in both mean and median vaccinated cases after the green pass, indicating that this policy effectively encouraged and drove up vaccination rates in a way that previous vaccination campaigns did not achieve. While other age groups also experienced increases, the impact was most prominent and significant in the 12-39 age group, showcasing the effectiveness of the green pass initiative in motivating vaccinations in this demographic. This analysis underscores the system's effectiveness [18, 19] in reaching and persuading younger demographics, a crucial segment in combatting the pandemic due to their higher propensity for social interactions and potential to contribute to community spread.

Table 1: the mean and median vaccinated cases before and after the introduction of the green pass on August the 6th 2021 for each age group (Source: GitHub available online at: https://github.com/italia/covid19-opendata-vaccini)

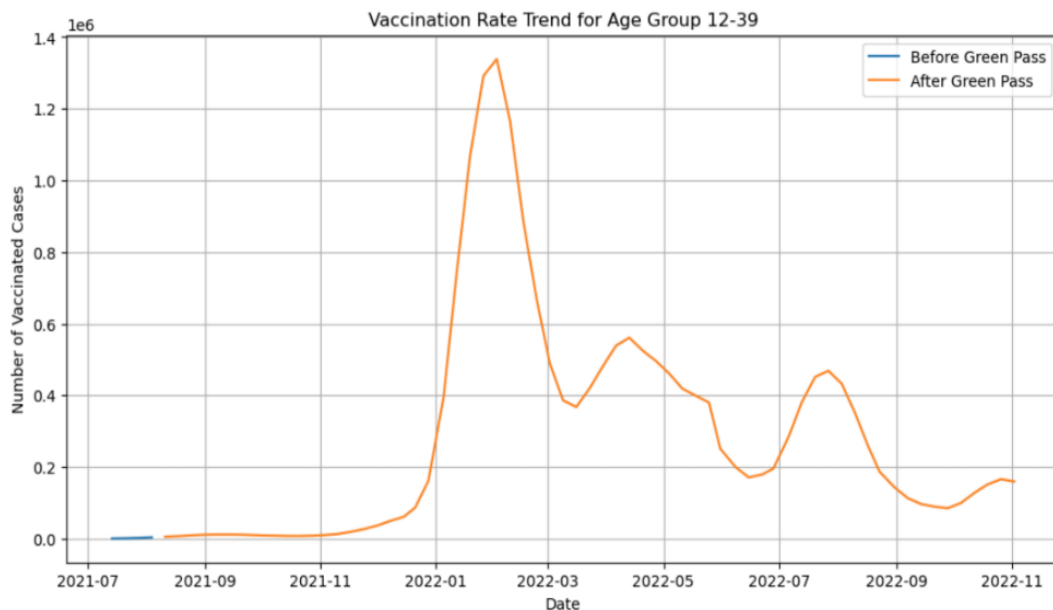|	Age Group 05-Nov	Age Group Dec-39	Age Group 40-59	Age Group 60-79	Age Group 80+
Mean before Green Pass:	7680.285714	1925	289497.1875	269011.3438	85689.3125
Mean after Green Pass:	4030.285714	292400.1406	400236.75	363713.9063	113145.9063
Median before Green Pass:	8466	1729	270248.5	247764	81736
Median after Green Pass:	2627	175081.5	329748.5	299773	95496

Figure 3: Impact of Green Pass on Vaccination Rates among 12-39 Year Old (Source: manipulation using Python programming of the data retrieved from GitHub at: https://github.com/italia/covid19-opendata-vaccini)

Future Implications and Recommendations

The success of Italy's green pass system holds profound implications for future pandemic management and public health strategies. The integration of behavioral science into policy design showcased its potential to shape behaviors and drive societal change, particularly during times of crisis. This sets a precedent for the future use of behavioral insights in formulating policies that promote public health, not just during pandemics but in various health-related domains.

1) Embedding Behavioral Insights into Policy Design:

Future pandemic responses should consider embedding behavioral insights into policy design [20]. Tailoring messages, framing policies, and leveraging behavioral nudges can significantly influence public behavior [21]. Understanding and addressing cognitive biases and heuristics are essential in constructing effective policies.

2) Privacy and Equity Considerations:

Future implementations of similar systems should address privacy concerns and ensure equitable access to public spaces [22, 23]. Striking a balance between public health imperatives and individual rights is paramount. Transparency and clear communication about data usage and privacy protection measures are crucial.

3) Research and Data Analysis for Informed Decision-making:

Continued research and comprehensive data analysis are critical for informed decision-making [24]. Tracking the impact of policies through rigorous data collection and analysis provides valuable insights into their effectiveness [25] and allows for adjustments to be made to optimize outcomes.

In conclusion, Italy's green pass system stands as a powerful case study showcasing the transformative potential of behavioral science in informing policy design during a global health crisis. By harnessing behavioral insights, Italy was able to orchestrate a remarkable surge in vaccination rates, a critical tool in combating the pandemic. However, this success is not without its ethical complexities. Balancing public health imperatives with individual liberties is an ongoing challenge, and future policy endeavors must navigate this delicate balance. This study serves as a beacon, illustrating the profound impact of interdisciplinary collaboration between behavioral science, policy-making, and public health, emphasizing the importance of informed, strategic policy design. It is an invitation to a broader dialogue, urging stakeholders to integrate behavioral insights into policy, creating a world where science and empathy converge to address the most pressing challenges of our time.

References

1. Matteo Maria Cati. Scientific Communication in the Storm: the War against the Fakedemic on COVID-19 Vaccines. Archives of Microbiology and Immunology 6 (2022): 171-187.

2. Oliu-Barton M, BSR, Pradelski N, Woloszko L, Guetta-Jeanrenaud P, Aghion P, et al. 'The effect of COVID certificates on vaccine uptake, health outcomes and the economy', Working Paper 01/2022 Bruegel (2022).

3. Report Esteso Istituto Superiore della Sanità – Covid -19: Sorveglianza, impatto delle infezioni ed efficacia vaccinale. Aggiornamento nazionale 12/10/2022 – ore 12.00. Data pubblicazione 14/10/2022. Prodotto dall'Istituto Superiore della Sanità (2022).

4. Ministero della Salute. Covid-19 - Situazione in Italia (2022).

5. Fondazione Gimbe – Comunicato Stampa - 21/10/2021. Situazione Coronavirus (2021).

6. Zimmermann BM, Paul KT, Araújo ER, Buyx A, Ferstl S, Fiske A, et al. The social and socio-political embeddedness of COVID-19 vaccination decision-making: A five-country qualitative interview study from Europe. Vaccine 41 (2023): 2084-2092.

7. Luca Marelli. The Italian debate on the digital COVID certificate: co-producing epistemic and normative rationalities, Science as Culture (2023).

8. Campanozzi, Laura Leondina, Vittoradolfo Tambone, and Massimo Ciccozzi. "A Lesson from the Green Pass Experience in Italy: A Narrative Review" *Vaccines* 10 (2022): 1483.

9. Giubilini A. *The ethics of vaccination*. Palgrave Macmillan (2019).

10. Gstrein O. The EU Digital COVID Certificate: A Preliminary Data Protection Impact Assessment. *European Journal of Risk Regulation* 12 (2021): 370-381.

11. Schrahe D, Städter T. Privacy preserving vaccinating- and testing-pass for the European Union. *Security and Privacy* (2023): e332.

12. He H. The Moral Foundations of Vaccine Passports. Journal of Business Ethics (2023).

13. Marrone, Maricla, Luigi Buongiorno, Alessandra Stellacci, Gerardo Cazzato, Pasquale Stefanizzi, and et al. "COVID-19 Vaccination Policies: Ethical Issues and Responsibility" *Vaccines* 10 (2022): 1602.

14. Pavlović T et al. Predicting attitudinal and behavioral responses to COVID-19 pandemic using machine learning, *PNAS Nexus*, 1 (2022): 093.

15. Mark A Hall, David M Studdert, Public views about COVID-19 'Immunity Passports', *Journal of Law and the Biosciences*, 8 (2021): lsab016.

16. Kalla T. Passport or affidavit: How vaccine passports could further divide populations and perpetuate cycles of inequality. Human Rights Pulse (2021).

17. Stefanizzi P, Bianchi FP, Brescia N, Ferorelli D, Tafuri S. Vaccination strategies between compulsion and incentives. The Italian Green Pass experience. Expert Rev Vaccines 21 (2022): 423-425.

18. Caserotti M, Girardi P, Rubaltelli E, Tasso A, Lotto L, Gavaruzzi T. Associations of COVID-19 risk perception with vaccine hesitancy over time for Italian residents. Soc Sci Med 272 (2021): 113688.

19. Moccia G, Carpinelli L, Savarese G, De Caro F. Vaccine Hesitancy and the Green Digital Pass: A Study on Adherence to the Italian COVID-19 Vaccination Campaign. Int J Environ Res Public Health 19 (2022): 2970.

20. Lichand G, Serdeira AdP, Rizardi B. Motivating the Use of Behavioral Insights. In: Behavioral Insights for Policy Design (2023).

21. Lichand G, Serdeira AdP, Rizardi B. Using Behavioral Insights in Practice. In: Behavioral Insights for Policy Design (2023).

22. LUSTER T, ALBIN E, GROSS A, TABENKIN M & DAVIDOVITCH N. Promoting Vaccination from a Human Rights and Equity Perspective: Lessons from the Israeli "Green Pass". *European Journal of Risk Regulation* 12 (2021): 308-320.

23. Ana Beduschi. "Covid-19 health status certificates: Key considerations for data privacy and human rights", ECIL Working Paper (2021).

24. Ash N, Triki N & Waitzberg R. The COVID-19 pandemic posed many dilemmas for policymakers, which sometimes resulted in unprecedented decision-making. *Isr J Health Policy Res* 12 (2023).

25. Zimmermann BM. et al. The social and socio-political embeddedness of COVID-19 vaccination decision-making: A five-country qualitative interview study from Europe, Vaccine 41 (2023): 2084-2092.