



Vaccination Status: Insurance Pricing Considerations

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The arrival of COVID-19 vaccines has revived the debate over the best ways to balance public health with individual liberties. Life and health insurers must answer a different question: whether to assess higher rates based on vaccination status.

Increasingly, epidemiologists suggest SARS-CoV-2 could become endemic, re-emerging cyclically and perhaps seasonally. This potential is fuelling growing interest in whether to differentiate life insurance premiums by vaccine status in my native South Africa and around the world. It's easy to understand why: During the second and third waves of rising COVID-19 cases, mortality rates for fully underwritten retail policies peaked at 3.5 and 4.5 times above expected levels, respectively⁶. Still, using vaccination status as a basis for increased pricing poses separate and equally complex challenges, and insurers ultimately must weigh multiple concerns. Some are outlined below:

1. Why Charge Unvaccinated Policyholders Higher Premiums?

- COVID-19 vaccines are highly effective at preventing hospitalization and death. Conversely, unvaccinated people have a much higher risk of death due to COVID-19 infection. Data released by the U.S. Centers for Disease Control and Prevention (CDC) shows that unvaccinated people have an age-standardized COVID-19 mortality rate 11 times higher than that of vaccinated people¹.
- Insurers typically aim to charge premium rates commensurate with the risk being underwritten. Since COVID-19 vaccination status has a significant impact on mortality, it makes sense to segment the risk rating much as insurers do for other lifestyle risks, like smoking or obesity.
- As per CDC statistics², the risk of death due to COVID-19 increases exponentially with age; however, this doesn't mean that COVID-19 is a risk only for much older people. For example, the CDC data shows that 40- to 49-year-old individuals have mortality rates ten times higher than those of 18- to 29-year-olds and that COVID-19 can result in mortality and morbidity for people of all ages.

Using the Actuarial Society of South Africa's dashboard⁶ for fully underwritten policyholders, we can compare the COVID-19 impact to historical mortality rates by age by examining actual, versus expected, deaths over a period from March 2020 to May 2021 in South Africa:

Age	Actual / Expected Deaths	Comment
30 – 39 years	162%	Deaths were 62% higher
40 – 49 years	182%	Deaths were 82% higher

Even if absolute COVID-19 mortality is considered low for those in their 30s, so too is the base mortality. From a pricing perspective, COVID-19 has a significant impact even at younger ages.

Charging differentiated rates might encourage vaccination, which is protective for the entire community, and if an insurer does not charge more for the unvaccinated, and competitors do, the insurer may attract disproportionately higher risks.

Insurers often evaluate overall healthy behavior when assessing a policyholder's risk. Vaccination status may be considered just another factor, like physical activity or medication-compliance, that indicates reduced risk. COVID-19 vaccination may also signal an increased openness to taking other vaccines and therefore reducing the individual's exposure to other infectious diseases.

Incorporating vaccination into underwriting still protects choice. Those who do not wish to be vaccinated may still purchase insurance, without affecting the cost to other policyholders.

2. Why Avoid Differentiating Premiums by Vaccination Status?

- Insurers may wonder whether pursuing long-term pricing changes for a specific vaccine makes sense, especially if COVID-19 represents a short-term mortality event. When the risk is short-term, it may be difficult for pricing actuaries to even determine how to load a long-term policy.
- Unlike typical mortality risks, COVID-19 does not present a linear risk. For example, if a person has a chronic health condition, that risk will continue to persist for the policy duration. COVID-19 will potentially see a high initial risk but could return to a standard risk over time.
- If COVID-19 risk is considered only for short-term pricing changes, what happens in five years? Would some sort of elevated premium for vaccine status provide an incentive for policyholders to lapse and then re-enroll?
- Underwriters already can consider certain co-morbidities and medical history that contribute to COVID-19 mortality risk. In fact, insurers don't currently use all available risk factors to price insurance policies, including policy holders' vaccinations for other diseases. One could argue that these should be used, but this may require a broader systemic change rather than a short-term response to the coronavirus. For example, should older policyholders be obliged to take annual influenza vaccinations?
- While it is true that an unvaccinated person has a higher risk of death from COVID-19, this condition alone doesn't define the individual's actual risk of death. Insurers may need to overlay the mortality risk from COVID-19 with the probability of being exposed to the virus and comorbidities.
 - ♦ For example, a smoker's mortality risk is much higher due to the nature of the habit. If that smoker is unvaccinated, however, his or her risk depends on exposure to the virus and how COVID-19 manifests over time.

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- ◆ Insurers could assume that much of the global population will be exposed to COVID-19 over the next 12-to-24 months as it becomes endemic, but this may not happen. Exposure will likely depend on overall immunity levels in a locality either due to vaccination rates or rates of past illness. Exposure could also be affected by future variants of the virus. Determining risks beyond a narrow timeframe of 24 months becomes increasingly difficult. Again, it may be challenging to apply long-term pricing strategies to a short-term risk.
- In a scenario where vaccination levels are high, is it still relevant to ask for vaccination status? In this case, vaccination status is less material as COVID-19 spread is reduced, and the mortality impact (at a portfolio level) is contained. With a much lower risk, insurers may be reluctant to add additional rating factors (particularly sensitive ones).
 - ◆ If the vaccination rate for insured lives increases to a high level, however, then it is possible that loading unvaccinated people will be reversed or re-considered (balancing application-stage effort versus benefit).
 - ◆ There is some early indication that individuals with insurance are being vaccinated at higher rates than the general population, and thus some caution should be applied in relying on national statistics in making these decisions.⁷
- A high COVID-19 infection rate is thought to have occurred in South Africa, with some estimates⁴ reaching as high as 70-80% of the population being infected. Pricing based on vaccine status in this context raises new questions: Should antibodies from prior COVID-19 infection be considered as an alternative to a vaccine? Insurers considering antibody tests may introduce survivor bias as new applicants may be more likely to have had COVID-19 already and yet may not provide a commensurate reduction in overall mortality risk.
- If new business doesn't represent the bulk of an insurer's risk, then insurers might find more meaningful risk management by offering incentives to in-force policyholders (with premium guarantees) to get vaccinated, rather than focusing on changing pricing for new policyholders who are unvaccinated, but who are otherwise standard risks.
- If effective and accessible anti-viral treatments emerge, vaccination might become less relevant to insurers. Given the fast-changing nature of the pandemic and accompanying medical treatments, changing insurance pricing may be premature. Any vaccination loading might need to be updated frequently to keep pace with evolving science and mortality outcomes. If insurers do elect to load policies, the loading ideally would be easily modifiable and treated independently from other risks.
- Is it not better to focus on margins across a portfolio because of pandemic risk in general?

3. Why Charge Everyone More?

The shock of a global pandemic has highlighted weaknesses in some insurance portfolios and prompted many insurers to re-evaluate life insurance pricing.

- Is sufficient margin being generated to service capital? Although roughly 100 years elapsed between the 1918 Influenza pandemic and COVID-19, insurers cannot wait another century to prepare for the next pandemic. Globalization, climate change, habitat destruction, and increased human interaction with animals mean that another novel infectious disease could emerge at any time. Indeed, a number of other novel infectious diseases have emerged in recent years, including the HIV-AIDS epidemic, as well as SARS, MERS, and Ebola.
- In many ways the outbreak of COVID-19 only reinforced the pressure some insurers already face

to improve the profitability of their portfolios. Insurers with lean or even negative margins prior to the pandemic must urgently remedy the root causes of underperformance as the appetite for risk shifts.

- Even vaccinated lives don't necessarily have a zero-mortality risk from COVID-19. No vaccine in history has been 100% protective, and risks will vary based on exposure and the danger posed by variants.

4. What Are In-force Considerations for Insurers?

While insurers are justifiably invested in managing new business risks, it also makes sense to take stock of in-force business. Depending on the insurer's maturity, in-force risk can vary. A new line of business may require different considerations than a more established one. For example, charging unvaccinated people higher rates could be more effective for a new insurer in reducing short-term risk. Regardless, lapse risk is likely to increase if premium rates are increased around vaccination status or for any other reason. Similarly, an insurer is unlikely to have insight into a policyholder's change in health status since the beginning of a policy, so any unvaccinated loading will be far broader, and insurers would have to consider whether it is necessary to ensure consistency between new policies and existing ones with expired guarantees. Other important considerations include:

- The case for charging everyone more. Insurers must question whether margins are sufficient and whether more capital should be held.
- All policy terms (e.g., guarantee periods) as well as guidance from regulators. Significant rate increases may raise questions around equity and fairness and could pose reputational risk.
- Other incentive programs that increase the vaccination rate within an existing block of business, even for policies with guaranteed premiums.

5. The Global View

When weighing options, context is an essential consideration as insurers seek to balance competing interests. The South African insured life experience has been significantly impacted by COVID-19, leading to losses across portfolios and the need for ongoing financial reserves to prepare for future waves of COVID-19 cases. ASISA's statistics⁵ up to 31 March 2021 show a 70% increase for individual life insurance claims. While this is not necessarily a complete assessment of actual excess mortality (due to exposure changes and considering incurred versus paid), it does dramatically highlight the impact of the pandemic. The excess claims since April 2021 (including the third wave of COVID cases) will only exacerbate these losses. Given the expectation that the impact of COVID-19 will continue, South African insurers have a reduced appetite for increased risk within their portfolios.

Insurers in other countries have not necessarily experienced losses to this degree, and with higher population vaccination rates in some nations, inclusion of vaccination status may be far less urgent, especially considering the sensitivities around the issue. At the time of writing, there is no indication globally that insurers have begun broadly using COVID-19 vaccination status to make standard life insurance policy or premium decisions. In some regions, vaccination status controversy has caused insurers to avoid this issue, due to reduced financial impact and reputational risks.

Below is a snapshot of life and health insurers' plans or actions around vaccination status, primarily within South Africa but also drawing on comments from insurers based abroad. The key focus is to offer premium discounts or rewards through existing programs. In some cases, as we'd expect locally in South Africa, vaccination status is used for a small proportion of applicants who have high-risk conditions.

Insurer	Proposed/ Actions
A	Not currently adjusting premiums but considering offering small discounts to vaccinated customers as part of their health product discounts based on other health factors, such as screening and standard BMI.
B	Not currently asking about vaccinations and no immediate plans to do so (although any necessity for booster shots could affect this).
C	Offering rewards points for fully vaccinated health and life insurance customers.
D	Offering rewards points to fully vaccinated health insurance customers.
E	Not currently asking for vaccination status nor planning to change acceptance guidelines or product adjustments.
F	For cases where the impact of COVID-19 "is known to be life threatening," typically postponing applications for new cover for 12 months unless customers can confirm they are fully vaccinated.
G (India-based)	Offering fully vaccinated adult customers a one-time, 5% discount on the purchase or renewal of the company's health product.
H (Based in the United States and Canada or within Asia and Europe)	Awarding points to life insurance policyholders who participate in the company's rewards program that can be used for reduced insurance premiums, travel, and retail discounts and savings on food and wearable fitness devices.

6. Balancing the Arguments

Arguments both for and against employing vaccination status in pricing are compelling. The choices ahead may not come in stark shades of black and white, but in a grey, with certain benefits and features offered or revoked based on vaccination status. For example, insurers could consider:

- Providing shorter-term discounts or loadings to align with various levels of risk and triggered within particular time frames, such as a first or second policy anniversary.

- Offering extra value for vaccinated policyholders in the short term. For example, insurers could increase coverage, offer new benefits, or restrict some existing product features to vaccinated policyholders.
- Reducing exclusions (e.g., setting waiting periods) for vaccinated people, or offering additional exclusions for unvaccinated people.
- Limiting optionality within products to those who have been vaccinated (e.g., offering a conversion option for group risk or the ability to increase cover at future dates for retail business).
- Offering positive rewards. As seen globally, insurers have used insurance-linked wellness programs to incentivize vaccination via new benefits, bonus points, or other rewards.
- Actively confirming vaccination status among older applicants or individuals with co-morbidities and determining whether to load, defer, or decline cover.

Where there is a desire to charge higher base rates for unvaccinated policyholders, insurers could consider aligning the additional loading approach with the applicant's risk profile. In this way, the additional premium would revert to a largely standard rate in the future. This could be achieved by:

- **Charging a higher initial premium rate.**

For example, where there is a defined premium escalation, an unvaccinated applicant could be charged a higher initial rate, such as what the premium rate might be in the third year. Premiums would converge to standard rates when the incidence of COVID-19 cases have permanently declined. This structure would align risk with pricing and reduce the lapse risk of these policies in the future.

- **Charge an additional premium for a fixed period.**

Insurers could explicitly charge unvaccinated policyholders an additional amount payable up to a defined point, such as in three years' time or until the policyholder submits proof of vaccination, if earlier.

- **Providing a lower initial cover amount.**

Rather than charging more, insurers could initially limit the cover amount due to natural death or reduce benefit amounts by a "COVID factor," while charging the standard premium rate. At a defined point, cover would increase to the full amount.

Any short-term structure would be heavily dependent on administration, cost of implementation, and the ability for these short-term changes to sufficiently compensate for the risk.

Because any loading or rating factor is a form of positive discrimination, insurers must remain aware of regulatory constraints and demonstrate that a system is fair, compliant, and reflective of experience. Hence, any adjustments would need to be based on objective data. Experience must also be monitored and pricing updated as scientific evidence and new risks (such as other variants) dictate.



7. General Considerations

If insurers use vaccination status to determine premiums, they could consider those who commit to getting vaccinated as vaccinated. Although this is less certain, it helps prevent the loss of a customer who is likely to get vaccinated anyway, while still creating social pressure for vaccination uptake.

Here the risk of intention versus action must be balanced. Some of these clients may never be vaccinated, even though they indicate they intend to do so (particularly if the premium rate is much higher). A later claim due to COVID-19 will be hard to decline if the person was not vaccinated as promised, and this creates potential for a reputational risk.

The insurer's objective will help guide this decision. Is the insurer's aim to completely align premium and risk or, alternatively, to generate greater discourse on the topic?

- What happens to a policyholder's premium rate if he or she gets vaccinated? Presumably the loading would fall away upon confirmation of the vaccination.
- If any medical reasons prevent a person from receiving a vaccine, allowances should be made.
- If a person doesn't have access to a vaccine for a specific reason (e.g., living in a rural setting and lacking transportation to an area where the vaccine is readily available), then this should be considered. This is likely to vary by region or country.
- How should insurers approach guaranteed-issue products, such as group, credit life and funeral products?
 - ♦ Insurers should consider whether vaccines been made sufficiently available to all prospective policyholders, including in rural areas.
 - ♦ For group risk annual repricing, understanding a group's overall vaccination rate would help determine the likely exposure to COVID-19 and inform the annual pricing cycle.
- If booster vaccines become necessary to maintain immunity or build immunity to new variants, the prospective policyholder's ongoing vaccination status becomes more relevant to assessing risk.
 - ♦ Annual repricing offers more flexibility in considering the question of whether to charge unvaccinated policyholders (or to reward vaccinated policyholders).
 - ♦ With annual repricing, group insurers may ask themselves whether each policyholder's vaccination status gets reviewed periodically.



- Marketing:
 - ♦ How do insurers present any approach to prospects? Will charging the unvaccinated be considered a challenge to anti-vaccination (or anti-COVID-19 vaccination) supporters? Will this pricing change be seen as a reward to those who follow the advice of government agencies?
 - ♦ Simply gaining access to a policyholder's vaccination status may help insurers better assess risks within a portfolio – even if the unvaccinated aren't charged more. Offering vaccination incentives to the in-force book could help insurers obtain this data while potentially also encouraging behavior changes.

Conclusion

It is unsurprising that policyholders' COVID-19 vaccination status is a topic of discussion and debate within the insurance industry. Adding vaccination status as a rating factor isn't necessarily straightforward, and insurers must weigh a wide range of considerations. Insurers may consider techniques to incentivize vaccination, or to levy short-term penalties, such as lower cover, reduced optionality, or higher premiums. Where vaccination rates are sufficiently high, it is expected that the ongoing impact of COVID-19 on mortality rates will be muted, and over time an applicant's COVID-19 vaccination status may become less compelling as a rating factor. Clearly, amid this global health crisis, in-force management has never been more important. Many insurers may seize this moment to consider a general premium increase as risk and capital are re-balanced.



Example Unvaccinated Cost Calculation

Determining how COVID-19 mortality risk varies would be an important factor to consider when setting a premium rate by vaccination status. In general, we know that risk varies by gender (males generally have a higher COVID-19 mortality rate than females), age, and co-morbidities (uncontrolled diabetes, obesity or high body mass index (BMI), and reduced kidney function³). One broad approach to determine the mortality differential for unvaccinated people could be as follows:

1. Use experience (excess deaths) to determine a COVID-19 infection fatality rate (i.e. a mortality rate once infected for unvaccinated people). This calculation should ideally be performed based on age and gender. Where experience includes vaccinated people, the unvaccinated rate should be adjusted (otherwise the impact will be understated). For example:

$$\mu_{\text{Unvaccinated}} = \mu_{\text{Total Covid-19}} / [\text{Unvaccinated \%} + (1 - \text{Vaccine Efficacy}) \times \text{Vaccinated \%}]$$

2. Estimate vaccinated mortality.

- ♦ One method includes calculating a rate based on vaccine efficacy:

$$\mu_{\text{Vaccinated}} = (1 - \text{Vaccine Efficacy}) \times \mu_{\text{Unvaccinated}}$$

If the CDC analysis¹ is considered, one could broadly expect this to be less than 10% of unvaccinated COVID-19 mortality.

One would have to consider how to handle different vaccines or partially vaccinated individuals. A single dose is protective and may indicate intent to become fully vaccinated.

- ♦ Alternatively, if research data (e.g., CDC information) is considered credible and applicable (considering variants, the populations studied, and the full reporting of number of deaths), the COVID-19 incidence rate for both vaccinated and unvaccinated people could be used as a basis for COVID-19 mortality adjustments.
- ♦ In either case, the vaccine efficacy rate is a key assumption.

3. Project COVID-19 infection waves over the policy duration

4. Apply the COVID-19 mortality to the probability of being infected.

The loading won't necessarily be a uniform percentage – so a mortality rate per 1,000 lives might be needed.

At RGA, we are eager to speak with clients about any support needed as we confront the COVID-19 challenge together. Contact us to learn more about the resources, solutions, and services available.

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