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# Abstract

Health insurance design involves a trade-off between the gains from risk pooling and the dead-weight loss from moral hazard. Research suggests that optimal designs a) protect the consumer against unpredictable high financial risks and b) include first-dollar cost sharing and individual caps on out-of-pocket expenditures. The Dutch design for supplementary insurance seems far from optimal since a) most healthcare services covered do not involve large losses and coverage limits are applied and b) moral hazard may be substantial because of first-euro coverage. Nevertheless, 84 per cent of the Dutch insured took out supplementary insurance in 2015. We therefore wonder why so many insured take out this seemingly suboptimal supplementary insurance. This paper indicates two potential explanations. Firstly, the theory on optimal insurance design is incomplete and can be extended with aspects other than risk reduction that provide a welfare gain to individuals when taking out supplementary insurance. Secondly, insured make suboptimal choices. Given these results, we provide several policy implications regarding the supplementary insurance.

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# 1. Introduction

With respect to the design of health insurance, theory emphasizes the trade-off between risk pooling and moral hazard (e.g., [9,29,33,46]). Studies on optimal insurance design recommend that a) health insurance protects individuals against unpredictable high financial risks and b) health insurance includes first-dollar cost sharing with an individual cap on out-of-pocket expenses. Seen from this theory, the design of the Dutch supplementary insurance seems far from optimal. On the one hand, the risk reduction resulting from the insurance is limited since most healthcare services covered do not involve large losses and because coverage limits are applied; on the other hand, substantial moral hazard can be expected because of first-euro coverage. Nevertheless, insurers keep offering and insured keep buying these policies. Given this background, this paper focuses on the question: why do insured take out this seemingly suboptimal supplementary health insurance? Based upon insights from behavioural economics, we provide two explanations 1) the theory on optimal insurance design is incomplete and can be extended with aspects other than risk reduction that provide a welfare gain to individuals when taking out supplementary insurance and/or 2) insured make suboptimal choices. The next section provides an extensive analysis of the problem in which we discuss the theory on optimal insurance design and the Dutch supplementary insurance. The third section elaborates on the extension of the theory on optimal insurance design with four potential aspects. Subsequently, section five provides the conclusion and discussion. The last section discusses the policy implications.

# 2. Analysis of the problem

## 2.1 Theory on optimal insurance design

The essence of insurance can be found in the transference of risk. Insurance implies that the insured pays a premium and in return receives some monetary amount from the insurer should an uncertain loss occur [21]. Additionally, Nyman [32] states that the benefits from health insurance can not only be found in the transference of risk but also in the fact that insurance provides access to healthcare services that would otherwise not be affordable. However, health insurance may also result in moral hazard, which refers to the change in health behaviour and healthcare consumption caused by the fact that the insurer reimburses (part of) the costs. So ultimately, health insurance design involves a trade-off between the gains from risk pooling and the deadweight loss from moral hazard. Many have studied the classical problem of this trade-off (e.g., [6,33,46]) and many researchers have theoretically analysed the balance between the gains from additional insurance and the efficiency losses from overconsumption of healthcare services (e.g., [3,17,58]). All these studies show that full insurance is far from optimal and that a mix between coverage and cost sharing is preferred. However, the results regarding this mix differ somewhat per study. We briefly mention the results of four studies regarding optimal insurance design. Firstly, Arrow [2] suggests that optimal insurance plans should have a stop-loss, which is a cap on total out-of-pocket expenses per individual or family. However, the empirical results of Manning and Marquis [29] indicate that the optimal stop-loss would be rather large (i.e., larger than US\$25,000<sup>1</sup>). Secondly, Manning and Marquis [29] additionally show that plans with first dollar cost sharing and a stop-loss appear to perform considerably better than pure stop-loss plans. For example, a plan with 25 per cent coinsurance and a stop-loss of €1,000 (i.e., the stop-loss is reached at healthcare expenses of €4,000) performs better than a plan with 100 per cent coinsurance and a stop-loss of €1,000 (i.e., similar to a deductible of €1,000, where the stop-loss is reached at healthcare expenses of €1,000). This is due to the fact that with pure stop-loss plans (i.e., the latter in the example) more insured exceed the limit and thereafter consume healthcare for free. Thirdly, Blomqvist [8] indicates that the efficient level of patient cost sharing is low. Fourthly, Buchanan et al. [9] analyse different insurance plans and provide three conclusions relevant for our discussion. Firstly, they show that even fairly small deductible levels (even of US\$100<sup>2</sup>) curb demand, which seems in accordance with Blomqvist [8]. Secondly, they state that caps on out-of-pocket expenses of US\$1,000 - 2,000<sup>3</sup> per person make good economic sense. Beyond this level the financial risk is greatly increased while demand is hardly reduced. Thirdly, they state that individual caps seem generally better than family caps. After all, with a family cap, hospitalization of one of the family members could take the whole family into a period of free care, while with an individual cap, the lower priced care (after the cap) is targeted at the sick individual only. Buchanan et al. [9] overall state that, according to their analyses, the best policy has a small initial deductible (between US\$100 - 300<sup>4</sup>), a 25 per cent coinsurance rate up to an individual cap on out-of-pocket expenses of US\$1,000<sup>5</sup>. In sum, although specifics sometimes differ, all studies point towards insurance designs with a) first-dollar cost sharing either in the form of deductibles, coinsurance or a combination, and b) an individual cap on out-of-pocket expenses to find a balance between the gains from risk pooling and the deadweight loss from moral hazard. We now turn towards the insurance design under study in this paper: the design of the Dutch supplementary health insurance.

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1 Dollars of 1995 that correspond to €32,400 in 2015. US dollars from 1995 are firstly converted to US dollars in 2015 using a rate of 1.56855. Secondly, those US dollars are converted to Euros using a (non-healthcare specific) exchange rate of 0.82623 (1 January 2015).

2 Dollars of 1983 that correspond to €199 in 2015. US dollars from 1983 are firstly converted to US dollars in 2015 using a rate of 2.40586. Secondly, those US dollars are converted to Euros using a (non-healthcare specific) exchange rate of 0.82623 (1 January 2015).

3 Corresponding to respectively €1,988 and €3,976 in 2015.

4 Corresponding to respectively €199 and €596 in 2015.

5 Corresponding to €1,988 in 2015.

## 2.2 The Dutch supplementary insurance

The introduction of the Health Insurance Act (2006) was an important step towards regulated competition in the Dutch healthcare system [14]. As of then, individuals are obliged to buy basic health insurance for community-rated premiums from a private health insurer [44]. For healthcare services not covered or only partially covered by basic health insurance, insured can take out supplementary insurance. Contrary to the basic health insurance market, the supplementary health insurance market is a free market. Insurers are free to determine which healthcare expenses are eligible for reimbursement, which premium they ask and which potential cost sharing arrangements and coverage maximums apply. Healthcare services covered by supplementary insurance include, among others, dental care, physiotherapy, aids, alternative medicines, pharmaceuticals, care consumed in a foreign country, orthodontics and maternity care, as far as these benefits are not covered by basic health insurance. In 2015, almost 84 per cent of the Dutch insured took out supplementary insurance and 78 per cent of the insured had coverage for dental care [52].

Insurers offer many different types of supplementary insurance: supplementary insurance without dental coverage, supplementary insurance with only dental coverage, supplementary insurance with dental coverage and coverage for other healthcare services (e.g., physiotherapy, alternative medicine, etc.) and group targeted insurances (e.g., elderly, students, families, athletes, etc.). Table 1 shows an example of the premium and coverage (comparing only the most commonly consumed healthcare services) for Dutch supplementary insurance policies with relatively small and relatively large coverage. It shows that the difference in both premium and coverage is quite large and that the use of healthcare services covered (especially in the large package) may be quite predictable in some cases. With respect to dental coverage, policies mostly cover 75-80 per cent of dental expenses up to an expenditure maximum<sup>6</sup>, except in case of the most extensive supplementary dental insurances, where 100 per cent coverage applies. The coverage limits range from €250 to €1,600 per year. A striking example of dental insurance (see table 2) shows that an individual pays an annual premium of €178 for insurance that reimburses not more than €250 per year. Another policy (see table 3) shows that an individual buying policy B is willing to pay about €200 additional annual premium for an increase in the annual maximum reimbursement of €250.

## 2.3 Conclusion

The theory on optimal insurance design states that a) the consumer should be protected against high unpredictable financial risks and b) that offering first-dollar cost sharing with an individual limit on out-of-pocket expenses gives the best trade-off between risk pooling and moral hazard. Seen from this perspective, the Dutch supplementary insurance seems far from optimal. After all, the risk reduction resulting from the supplementary insurance seems small since on the one hand most healthcare services covered concern small losses and because coverage limits are applied and on the other hand moral hazard is expected to be substantial due to first-euro coverage. This makes us wonder why (so many) Dutch insured take out this seemingly suboptimal supplementary insurance. The next sections elaborate on two potential explanations.

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<sup>6</sup> Some policies offer 100 per cent reimbursement for consultations, diagnostics and fillings.



**Tabel 1 Example of premium and coverage for Dutch supplementary insurance policies** with relatively small and relatively large coverage additional to the coverage provided by the basic insurance.

Small package - €7 per month	Large package - €42 per month
Physiotherapy: 9 treatments per year	Physiotherapy: 40 treatments per year
Emergency care in a foreign country <sup>a</sup> : 100%	Emergency care in a foreign country <sup>a</sup> : 100%
	Glasses: up to €150 per two years
	Alternative medicine: 80% up to €600 per year
	Maternity care: 100%

<sup>a</sup> I.e., when an individual needs emergency care in a foreign country, the basic insurance policy covers 100 per cent of the expenses but at most the price of a similar treatment in the Netherlands. This supplementary insurance provides 100 per cent coverage for the healthcare expenses that are not covered by basic insurance.

**Tabel 2 Example 1 Dutch dental insurance.**

Dental insurance	
Premium	About €180 per year for 65+ insured
Coverage	Consultations, mouth hygiene, fillings and extractions: 100% Other treatments: 75%
Reimbursement maximum	€250 per year

**Tabel 3 Example 2 Dutch dental insurance.**

	Dental insurance A	Dental insurance B
Premium per year for individuals age 65+	About €400	About €600
Coverage		
Consultations, mouth hygiene, fillings and extractions	100%	100%
Other treatments:	75%	100%
Reimbursement maximum	€1,000 per year	€1,250 per year

# 3. Extension of the theory on optimal insurance design

In the theory on optimal insurance design, the gains from risk pooling are determined based upon a risk aversion parameter [6], which is calculated according to Pratt [7]. Risk aversion is then determined according to expected utility theory [54], where risk aversion is equivalent to the concavity of the utility function. In that case, an individual is risk averse if he prefers a certain prospect ( $x$ ) to any risky prospect with expected value  $x$ . For instance, an individual is risk averse if he prefers a certain gain of 100 to a gain of 200 with probability .5 (and 0 with probability .5). However, if prospects are states in terms of losses instead of gains (i.e., a certain loss of 100 or a loss of 200 with probability .5), individuals prefer the latter option [25]. An explanation of the high uptake of the Dutch supplementary insurance, related to the theory on optimal insurance design, could be that Dutch insured are extremely risk averse. This high risk aversion could cause the risk reduction to outweigh the deadweight loss from moral hazard. If this were true, however, one would expect (much) higher coverage limits than those in the examples above. Additionally, Getzen [21] formulates the welfare gain from insurance not as the reduction of risk but as the reduction of **financial uncertainty**. We therefore suspect that the welfare gain from supplementary health insurance may comprise more than just the reduction in financial risk. Hence, we discuss four potential aspects that could extend the theory of optimal insurance design.

## 3.1 Loss aversion

A first potential aspect to extend the theory on optimal insurance design concerns loss aversion. Loss aversion is explained by Kahneman and Tversky [25] as the phenomenon that 'losses loom larger than gains' and that 'the aggravation that one experiences in losing a sum of money appears to be greater than the pleasure associated with gaining the same amount'. Wakker [55] emphasizes that loss aversion only plays a role in mixed prospects (i.e., where the outcome of a prospect is either a gain or a loss) and no role in pure gain and pure loss prospects. Loss aversion is denoted by  $\lambda$  and Tversky and Kahneman [51] estimated  $\lambda$  to be 2.25, meaning that the pain of losses is felt 2.25 times as much as the joy of gains. In the health domain, Attema et al. [4] estimated  $\lambda$  to be 1.18. The presence of loss aversion depends on the perception of the reference point and prospects coded as losses from this reference point are affected by loss aversion. The current state of wealth is often assumed to be the reference point in any decision, although the expected state could be the relevant reference point in some situations [57]. Additionally, Hershey and Schoemaker [22] and Bleichrodt et al. [7] found that one of the offered options is often taken as the reference point. Furthermore, Camerer [10] states that by making one option in a decision the default option, this option serves as a reference point that individuals move away from only reluctantly. Samuelson and Zeckhauser [43] add that loss aversion could cause individuals to be biased in favour of the status quo.

Concerning the Dutch supplementary insurance, the taken reference point (i.e., either supplementary insurance or no supplementary insurance) is essential to the effect of loss aversion. When taking out supplementary insurance (especially via the internet), Dutch insurers guide individuals through the different choices they have to make (i.e., which basic insurance, which deductible level and which supplementary insurance(s)). With respect to the supplementary insurance choice, some insurers attach virtual labels to one of the offered policies stating "most commonly chosen (in your situation)", nudging insured to take out supplementary insurance by carefully setting the default option. Next to the fact that most insured already had supplementary insurance in the previous year (i.e., their current state of wealth), this might additionally provide individuals with a reference point equal to having a supplementary insurance. From this reference point, the decision to take out supplementary insurance concerns a mixed prospect, meaning that the insured could either lose the premium paid or gain the healthcare services reimbursed (i.e., when taking out supplementary insurance). Therefore, the decision to take out supplementary insurance seems to be subject to loss

aversion and an aversion to potential out-of-pocket expenses for healthcare services not covered by insurance could evolve (i.e., in case of not taking out supplementary insurance). This could result in a preference for the status quo (i.e., having supplementary insurance)<sup>7</sup>. Given the taken reference point, loss aversion, *ceteris paribus*, increases the consumer's welfare gain from taking out supplementary insurance. In that manner, loss aversion could be a potential extension of the theory on optimal insurance design.

### 3.2 Ambiguity aversion

A second potential extension of the theory on optimal insurance design concerns ambiguity aversion<sup>8</sup>. Ambiguity aversion captures individuals' preference for prospects with known probabilities over prospects with unknown probabilities and was first presented by Ellsberg [13]. In a hypothetical experiment individuals were confronted with two urns. The first urn contained 100 red and black balls in an unknown ratio and the second urn contained exactly 50 red and 50 black balls. The majority of respondents preferred to bet on either red or black in urn two rather than in urn one, although the expected outcome for both urns was the same, indicating ambiguity aversion. Ambiguity gives rise to 'one's degree of confidence in an estimate of relative likelihoods' [13]. Frisch and Baron [20] add that missing information that is relevant and could be known creates uncertainty about probabilities. Ritov and Baron [41] show the presence of ambiguity aversion in healthcare in a study on children's vaccination, where the vaccination reduces the risk of dying from a specific disease, but simultaneously might have adverse health effects. When ambiguity about the risk of adverse health effects was caused by missing information (i.e., a child had a high or no risk of adverse effects, but it was impossible to find out which) individuals were more reluctant to vaccinate, indicating ambiguity aversion. Note that from ambiguity aversion it follows that individuals will value provision of any information that reduces their ambiguity, even if it will not change their decision, while standard economic theory predicts that the demand for information depends on its value in making decisions [11]. Ellsberg [13] adds that individuals often perceive the status quo as the situation with low variation and that ambiguities of the new situation are more salient than those of the current situation. When deciding to take out supplementary insurance, ambiguity aversion might create a preference for taking out supplementary insurance. This is caused by the fact that uncertainty (or ambiguity) is present in the situation without insurance. After all, insured do not know their probability (and are bad at estimating this probability) that healthcare expenses occur that could have been covered by supplementary insurance. In contrast, if the insured takes out supplementary insurance, no ambiguity (or uncertainty) exists regarding reimbursement, since this is made clear within the supplementary insurance policy. This implies that ambiguity aversion, *ceteris paribus*, increases the consumer's welfare gain from taking out supplementary insurance. In that manner, ambiguity aversion could be a potential extension of the theory on optimal insurance design.

### 3.3 Liquidity constraints

A third potential aspect that could be an extension of the theory on optimal insurance design concerns liquidity constraints potentially experienced by insured. Liquidity constraints imply that individuals do not have the financial possibilities to free up an (substantial) amount of money at some point in time. For instance, if individuals do not take out supplementary insurance, but unexpectedly need several treatments from a healthcare provider that are not covered by basic health insurance, they might not be able to pay the bill they receive. This might be due to the fact that they are financially illiquid. Since this situation could be prevented, at least for healthcare services that are covered by supplementary insurance, individuals might be more inclined to take out supplementary insurance. Of course, individuals then have to pay a (additional) monthly premium but they prevent the unpleasant situation where they cannot pay the bill (or even forego care) due to liquidity

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7 Note that this could also imply that for insured whose perceived reference point includes no supplementary insurance, a preference for this status quo could arise meaning that they do not take out supplementary insurance in the next year.

8 Ambiguity aversion is sometimes also referred to as uncertainty aversion.

constraints. Furthermore, insured could perceive potential liquidity constraints if they would not take out supplementary insurance because they highly overestimate the insurance coverage provided by supplementary insurance. Additionally, Chetty and Szeidl [12] conclude that consumption commitments increase risk aversion for small and moderate stakes because they are costly to adjust (e.g., mortgage payments can only be adjusted by selling your house). After all, if an insured would be forced to reduce spending by 10 per cent and he has precommitted 50 per cent of his income, he must reduce spending on discretionary goods or services by 20 per cent. Furthermore, Wicker et al. [56] state that there is more loss aversion when a greater proportion of money is designated for necessities. This is in accordance with Novemsky and Kahneman [31] who state that if individuals maintain a tight budget, the purchase of a good that was not budgeted for is associated with giving up some other good (i.e., either consumption or savings), which is therefore evaluated as a loss. These studies show that liquidity constraints could affect the decision to take out supplementary insurance and are related to the gain of insurance in terms of the reduction of financial uncertainty. This implies that liquidity aversion, *ceteris paribus*, increases the consumer's welfare gain from taking out supplementary insurance. In that manner, liquidity constraints could potentially extend the theory on optimal insurance design.

### 3.4 Debt aversion

A fourth potential extension of the theory on optimal insurance design concerns debt aversion. Debt aversion stems from mental accounting theory [49,50] and is shown by individuals' preference to prepay for consumption and to get paid for work after completion. Prelec and Loewenstein [36] predict strong debt aversion because individuals tend to create linkages between consumption of goods or services and the payment for these goods or services. Essentially, individuals dislike the feeling of 'having the meter running'. A phenomenon called the flat rate bias indicates that individuals prefer flat-rate pricing schemes even if they pay more for the same usage [36,50]. This is for instance shown by a preference for unlimited internet access at a fixed monthly price over paying per megabyte. Debt aversion is explained by two motives: a) individuals hope to enjoy the product or service untroubled from payments concerns, and b) individuals want to avoid the unpleasant experience of paying for consumption that has been enjoyed already. After all, that drink on a sunny day at the swimming pool terrace of an all-in resort tastes a lot better knowing that it is already paid for.

So, debt aversion predicts that insured prefer flat-rate pricing schemes (e.g., (supplementary) health insurance) and dislike paying for healthcare after consumption. This makes it relevant for the decision to take out supplementary insurance. After all, with supplementary insurance, healthcare services (up to a maximum) do not have to be paid after usage, but are prepaid through a monthly flat rate. Without supplementary insurance, the individual receives a bill after usage of the healthcare service, which is not preferred as a result of debt aversion. This implies that debt aversion, *ceteris paribus*, increases the consumer's welfare gain from taking out supplementary insurance. In that manner, debt aversion could be an extension of the theory on optimal insurance design.

## 4. Making a suboptimal choice

The four abovementioned aspects could indicate why the welfare gain resulting from taking out supplementary insurance in the Netherlands is potentially larger than expected based upon the theory on optimal insurance design. This section provides a second explanation of why so many Dutch insured take out supplementary insurance. Insured might simply make suboptimal choices due to several behavioural economic aspects, meaning that individuals take out supplementary insurance while theoretically not taking out supplementary insurance would be 'optimal'.

### 4.1 Ignorance

A first potential aspect that could potentially indicate why insured make a suboptimal choice when taking out supplementary insurance could be found in individuals' ignorance concerning the insurance. Several researchers show that insured have limited knowledge about their health insurance (e.g., [23,39]). Others add that individuals misunderstand complex price schedules including premiums and cost sharing arrangements [5,28,30]. A study by a Dutch comparison website for, among others, health insurance, also shows that Dutch individuals lack knowledge about their health insurance [37]. Individuals for instance do not know what type of health policy they have and are ignorant with respect to aspects such as deductibles, coverage and healthcare providers covered. Especially insured with lower education, young insured and elderly insured have limited knowledge about these concepts. As a result, the Dutch minister of Health, Welfare and Sports has announced to improve the information to individuals concerning quality and expenses of healthcare [45].

Because of two reasons it could be expected that ignorance indeed affects the insured's decision regarding the supplementary insurance. Firstly, it could be expected that insured do not (exactly) know what they insure against by taking out supplementary insurance. Insured could for instance not know which benefits are covered and which coverage limits and cost sharing arrangements are in place. They might feel like they insure unpredictable and large potential losses, but might be unaware that they are (also) insuring regular check-ups at the dentist. Secondly, it could be expected that insured do not know the costs of healthcare services that are (not) covered by insurance. This makes it hard for insured to make their own trade-off between the premium for supplementary insurance and the healthcare services covered by supplementary insurance, causing them to potentially make a suboptimal choice.

### 4.2 Social comparison

A second potential aspect that could explain why insured take out supplementary insurance concerns social comparison. Friedl et al. [19] propose that social comparison might be a factor affecting individuals' willingness to purchase insurance. This social comparison is modelled via preferences where utility depends both on one's own payoff as well as the payoff of relevant peers [16]. In their study on peer effects in risk taking, Lahno and Serra-Garcia [27] state that imitation is the most frequent form of peer effect and that a norm to conform to the peer may explain why peer choices indeed matter. Richter et al. [38] therefore state that individuals reflect upon what their peers decide and might think 'if my peers are purchasing insurance, I should purchase insurance for myself as well'. Potentially the behaviour of peers (e.g., family and friends) might affect the decision to take out supplementary insurance as well: "if many of my friends and family take out supplementary insurance, I will do too, but if almost nobody takes out insurance, I am also not going to take out supplementary insurance". We additionally wonder what the effect of the media could be on the decision to take out supplementary insurance. After all, the last few years, the Dutch media paid much attention to the decision to take out supplementary insurance. They advised individuals to critically review their supplementary insurance and decide whether a supplementary insurance would be necessary. The Dutch Association for Consumers (i.e., "De Consumentenbond") even advised insured to potentially not take out supplementary insurance and to save the premium, which

could be used in case any healthcare services are needed. A relevant question in this case would be whether individuals view the media as relevant peers. As long as many insured take out supplementary insurance, social comparison could potentially explain why many insured take out supplementary insurance.

### 4.3 Decision avoidance

A third potential aspect that could indicate why insured make a suboptimal choice for their supplementary insurance regards a phenomenon called decision avoidance. Decision avoidance manifests itself, according to Anderson [1], as a tendency to avoid making a choice by postponing it or by seeking an easy way out that involves no action or no change. Several underlying factors could contribute to decision avoidance: omission bias, choice and information overload, search and transaction costs and regret avoidance. These underlying factors will be discussed briefly related to the decision to take out supplementary insurance.

A first underlying factor causing decision avoidance is omission bias. Ritov and Baron (1992) explain status quo bias (i.e., individuals' tendency of doing nothing or maintaining one's current or previous decision [43]) by the fact that changing the status quo requires an act, while maintaining the status quo only requires an omission. They define omission bias as a reluctance to take action to change the current state. Since insured might indeed be reluctant to take action to change, they may automatically renew their current health insurance policy, which mostly includes a supplementary insurance.

A second underlying factor contributing to decision avoidance regards choice and information overload. Research in both economics and psychology questions whether more choice is always in the consumer's interest. Consumers could be overwhelmed by too much choice [24]. Frank and Lamiraud [18] additionally state that the relationship between the size of the choice set and the quality of the decision-making is an inverted U-shape. Particularly when choice involves health and money – which are both part of the decision to take out supplementary insurance – consumers facing many choices may revert to the status quo even if superior options are available [26]. With respect to the supplementary insurance, many different insurers offer many different types of insurances, with different benefit packages, for different premiums, with different cost sharing arrangements. This could cause the individual to be overwhelmed by too much choice and, as a result, the insured could choose to defer the choice and not make any decision at all [18]. This implies, as with omission bias, that if the insured already has a supplementary insurance, this policy will probably be automatically renewed in the next period.

A third underlying factor of decision avoidance regards search and transaction costs. Consumer search is costly and a rational consumer will search until the cost of additional searching outweighs its expected benefits [18]. Also, the information or cognitive overload theory argues that, as the choice set grows, the cost of one's information processing increases [15]. Even if consumers use shortcuts, information-processing costs grow with the choice set. Transaction and search costs, with respect to the supplementary insurance, regard the time and effort it takes for an individual to determine whether or not to take out supplementary insurance and, if so, which supplementary insurance to take out [47]. As mentioned before, many different insurers offer different types of supplementary insurances for different premiums, with different coverage limits and cost sharing arrangements. Therefore, search and transaction costs might be very high with respect to the decision to take out supplementary insurance. This could, again, cause insured to automatically renew their current health insurance policy.

A fourth underlying factor of decision avoidance might be regret avoidance, which implies that whenever choice can induce regret, individuals have a tendency to eliminate the choice [48]. Regret avoidance helps explain individuals' preference for first dollar coverage, since many individuals find decisions that involve a trade-off between healthcare and money unpleasant [48]. Due to regret avoidance, insured (again) might take out supplementary insurance, because they may regret not taking out supplementary insurance if healthcare expenses do occur and have to be paid for out-of-pocket while it would, in retrospect, have been financially profitable to take out supplementary insurance.

# 5. Conclusion and discussion

## 5.1 Conclusion

Theory suggests that optimal insurance design protects individuals against unpredictable high financial risks and involves first-euro cost sharing with an individual cap on out-of-pocket expenses. When studying the Dutch design for supplementary insurance, we see that it is far from optimal given the assumptions in the theory on optimal insurance design. The risk reduction resulting from the Dutch supplementary insurance is limited since most healthcare services covered regard small losses (e.g., consultations at the dentist) and coverage limits are applied and because moral hazard is expected to be substantial due to first-euro coverage. We therefore wonder why so many Dutch insured (i.e., almost 84 per cent of the population in 2015) take out this seemingly suboptimal supplementary insurance. A first potential explanation is that the theory on optimal insurance design is incomplete and can be extended with aspects other than risk reduction that provide a welfare gain to individuals when taking out supplementary insurance. In the presence of loss aversion, ambiguity aversion, liquidity constraints and/or debt aversion, the consumer's welfare gain from taking out supplementary health insurance could be larger than just the reduction in financial risk as stated in the theory of optimal insurance design. For consumers who already have supplementary health insurance, loss aversion increases the welfare gain from renewing their insurance policy since the potential loss of not renewing (i.e., the possibility of incurring out-of-pocket expenses) outweighs the gain of not renewing (i.e., saving the premium). Ambiguity aversion increases the consumer's welfare gain since supplementary insurance takes away the uncertainty involved in determining the expected out-of-pocket expenses. Liquidity constraints increase the consumer's welfare gain since supplementary health insurance may conserve liquidity. Debt aversion increases the consumer's welfare gain since the flat-rate pricing scheme of supplementary insurance is preferred over paying per usage. A second potential explanation of why so many Dutch insured choose this seemingly suboptimal supplementary insurance is that insured simply make suboptimal choices due to several behavioural economic aspects: ignorance, social comparison and decision avoidance. Insured might be unaware what they exactly insure against and what the costs for healthcare services are. As a result of this ignorance, they take out supplementary insurance, not knowing what they actually insure. Social comparison (i.e., peer effects) might explain why many insured take out supplementary insurance, because 'all my friends and family take out supplementary insurance'. Finally, due to decision avoidance insured might automatically renew their current health insurance policy (mostly with a supplementary insurance) without critically reviewing whether they indeed want (and need) this insurance. The final sections of this paper provide two points for discussion and, by incorporating the theory on optimal insurance design and the two explanations, elaborate on the policy implications.

## 5.2 Discussion

We provide two points for discussion regarding the explanations of why so many Dutch insured take out seemingly suboptimal supplementary insurance as mentioned within this paper. Firstly, the second explanation mentioned in this paper regards the fact that insured make a suboptimal choice when taking out supplementary insurance. This may however not hold for all insured. After all, some insured might take out supplementary insurance because they know they will financially profit from it. For instance, if insured know for certain that they will need nine treatments at the physiotherapist, it is financially more profitable for them to buy a (cheap) supplementary insurance policy than it is to pay for the nine treatments (i.e., about €30 per treatment) out-of-pocket. Research does however show that in 2013 only 70 per cent of the Dutch insured with a supplementary insurance, indeed filed bills to their insurer for reimbursement [53]. This means that the other 30 per cent of the insured pays a monthly premium for supplementary insurance, but never submits any claims. Secondly, an explanation not mentioned in this paper before regards the fact that no better alternative supplementary insurance policy is offered at the Dutch supplementary insurance market. It follows that if individuals want to buy insurance for healthcare services not covered by basic insurance, their

only option is to take out the current (suboptimal) supplementary insurance. A question that may rise then is why insurers do not offer alternative, more optimal, supplementary insurance policies. A first potential explanation is that, as mentioned above, other aspects that provide a welfare gain to individuals may affect the decision to take out supplementary insurance. As a result, there might be no need (and no demand) for alternative insurance policies. Secondly, the demand for solidarity by the Dutch society might prevent insurers from offering alternative policies. Based upon the theory on optimal insurance design, such policies would most likely imply a tendency towards equivalence (i.e., risk rating and risk selection) at the supplementary insurance market. However, the Dutch society demands solidarity even for healthcare services offered at the free supplementary insurance market. Therefore, a potential fear of reputation loss might prevent insurers from offering such policies.



## 6. Policy implications

This final section elaborates on the policy implications, incorporating the theory on optimal insurance design and the two mentioned explanations. In this elaboration, we distinguish among implications that a) intend to improve the design of the supplementary insurance and b) strategies that intend to facilitate well informed decision-making.

### 6.1 Alternative design

With respect to the design of the supplementary insurance, a potential strategy could be to implement a health insurance policy that a) provides protection against actual unpredictable and large losses (e.g., dental care after an accident), b) has first-euro cost sharing with an individual cap on out-of-pocket expenses and c) provides the option to save for predictable small losses. Due to the first aspect of this policy (i.e., a), insured are covered for unexpected large potential losses that are not already covered by basic insurance instead of covered for healthcare expenses that are predictable and small (e.g., consultations at the dentist), as is currently the case. This coverage could mean a welfare increase to insured since the risk reduction is larger than with the current design of the supplementary insurance. It could also affect ambiguity aversion since with such a policy, insured do know what they are insured against and know that all unexpected large losses are reimbursed. Due to the second aspect of this policy (i.e., b), which is based upon the results from the study by Buchanan et al. [9], individuals might be more incentivised to be sparing with healthcare usage. This could potentially counteract moral hazard. The individual cap on out-of-pocket expenses additionally protects insured from bills they cannot pay and makes sure that not too high expenses need to be paid in order to receive care. With the third aspect of this policy (i.e., c), insured are provided with the possibility to save for expenses that are predictable and small (e.g., dental consultations or regular treatments at the physiotherapist) instead of insuring against these expenses, as in currently the case. Note that with saving, the individual does not pay for the (high) moral hazard and high loading fee that characterises supplementary insurance policies. Insurers could of course offer combinations of the supplementary insurance, cost sharing arrangements and a savings account. This third aspect could affect debt aversion since the savings account could serve as a prepayment vehicle that diminishes the attenuation of the payment on the pleasure of consumption. It might also affect liquidity constraints since an earmarked savings account could serve as a consumption commitment especially for predictable small losses not covered by insurance or cost sharing. It could also affect loss aversion since with a savings account loss aversion is no longer present since insured only lose the savings in return for consumed healthcare services while they otherwise keep the savings and could potentially transfer it to next year's expenses.

### 6.2 Facilitating the insured's decision-making process

Finally, three potential strategies could facilitate the individual's decision-making process. Firstly, information could be provided to insured concerning the design and coverage of the current supplementary insurance. This strategy provides insights into the reimbursement and the type of healthcare services actually insured. As a result, insured might potentially be more equipped to determine whether they actually want and need to take out this type of insurance. Ignorance could be affected with this strategy since it provides insured with transparent information on the actual insurance policy they take out and empowers them to make a decision regarding the supplementary insurance that best fits their needs. A second potential strategy to facilitate the insured's decision is to provide insured with information on group and individual usages of healthcare services covered by supplementary insurance. Information could be provided on how often insured (i.e., on the individual or group level) consume certain healthcare services not covered by basic insurance. This also provides insured with information on the (average) costs of these healthcare services. Such a strategy could affect ambiguity aversion since it provides insured with information on the probability that they will consume healthcare expenses that could be covered by supplementary insurance. It

could additionally affect social comparison since insured could be provided with information on the average healthcare usage of their relevant peers (i.e., individuals with for instance the same age and gender). A third potential strategy to facilitate well informed decision-making is standardisation of the health insurance policies. This strategy could be similar to the standardisation of the set of benefits in Medigap in the United States of America, where insurers may only offer one out of ten standardised policies. Rice et al. [40] show that due to this standardisation insured are better able to make informed choices. A step in this direction is already made by 'Health Insurers the Netherlands' (all Dutch insurers are member of this association), in their plan of action where they state to intend to provide clear policies to insured [59]. This strategy could also respond to decision avoidance, since if insured are in the right supplementary insurance policy of their choice, they are able to automatically renew this policy (as a result of decision avoidance).

### **6.3 Further research**

The ideas presented above could potentially increase consumer welfare. It should be emphasized, however, that the arguments presented in this paper are not more than hypotheses. Further (empirical) research is needed to determine whether and to what extent the potential extensions to the theory on optimal insurance design and the ideas on consumer choice hold true in practice.



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