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## Designing pension communication

### Lessons from the medical domain

**Pension participants face complex decisions which require them to choose between multiple alternatives that have different consequences, that vary in likelihood, and that often relate to different values. In the medical domain, ample research has been conducted on how to support patients in making such decisions, yielding three important lessons. First, by emphasizing the gist of information, the information becomes more meaningful to participants. Second, value clarification methods should be used to help participants retrieve or form their own values and compare those with the decision alternatives. Third, simple static visual aids facilitate the comprehension of statistics and probabilities.**

#### 1. Introduction

Participants in a pension scheme face complex decisions which involve considering the pros and cons of a situation. These pros and cons can be weighed differently, depending on people's preferences (Hoeken et al., 2011). It is difficult to make decisions in an environment with many uncertainties (e.g., Autoriteit Financiële Markten,<sup>1</sup> 2016; Autoriteit Financiële Markten, 2020; Debets, Prast, Rossi & Van Soest, 2020). As a result, some participants make infelicitous pension decisions while others procrastinate or reach no decision at all. Infelicitous decisions,

in particular, can lead to severe financial problems after retirement and to loss of trust in the pension sector. This is detrimental to both participants and society as a whole.

In the Netherlands, for instance, pension participants can choose between a monthly income that remains fixed for their entire retirement period, or one that varies annually. The latter option will in many cases lead to a higher income, but there is also a chance that it will lead to a lower income compared to that of the fixed option. Which option is better depends on how important participants consider the higher income. For example, whether participants think that they can make ends meet and enjoy retirement as envisioned with a lower income, how likely they think the variable option will lead to a lower income compared to the fixed one, and how prepared participants are to deal with the uncertainty associated with the variable option. Because these factors are valued differently, which option is best will differ from one person to another. These decisions are especially difficult for less-literate and less-numerate pension participants (e.g., Klapper, Lusardi & Van Oudheusden, 2015).

In the medical domain, patients face comparable decisions. When choosing between different possible treatments, it is often the case that “there is more than one option, and neither is clearly better, or (...) options have benefits and harms that people value differently”

(Stacey et al., 2017, p. 2). For example, some patients have to choose “between some functionality with impairment and a procedure or operation that offers improvement but with some risk of death or even worse disability” (Reyna, 2008, p. 855). Medical decisions and decisions in the pension domain are comparable in other respects as well. Medical decisions can be about different prevention methods, different treatments, or disease detection. Likewise, some pension decisions can be perceived as prevention decisions (e.g., to prevent financial difficulties in the future), as treatment decisions (e.g., choosing between different pension plans), or (to a lesser extent) as detection decisions (e.g., finding out whether they are saving enough for retirement). In addition, complex decisions both in the pension domain and in the medical domain are especially difficult for less-literate and less-numerate patients (McCaffery et al., 2013).

Ample research has been conducted on how to support less literate and less-numerate patients to make these kinds of medical decisions. Often, the focus is on decision tools. These tools are interventions that people can use when making complex decisions. Stacey et al. (2017) conducted a review (including 105 studies and involving 31,043 participants) to assess the effectiveness of decision tools when people are faced with treatment or screening decisions. Their results indicate that decision tools improve medical decision making in a number of ways. For example, decision tools increase the knowledge of options and outcomes (based on higher scores on knowledge tests), lead to more accurate perceptions of outcome probabilities, help people to feel better informed about options and more comfortable with their decisions, and provide them with a better view of their relevant personal values.

Because of the comparability between pension decisions and medical decisions, we argue that knowledge from the medical domain is relevant to support decisions in the pension domain. Therefore, in this paper we will

describe three lessons from the medical domain that have received empirical support. Our goal is to transfer these lessons from the medical domain to the pension domain and thereby provide new, evidence-based perspectives on the presentation of pension information intended to support decision making. We will not discuss advice on the use of plain language and the avoidance of jargon and abbreviations because this is well-known (e.g., Fagerlin, Zikmund-Fisher & Ubel, 2011 or Meppelink, Smit, Buurman & Van Weert, 2015). Belgium, the Netherlands, and the United Kingdom, for example, have already embed in their pension legislation the need to present information in plain and jargon-free language (EIOPA,<sup>2</sup> 2021)).

The lessons we describe include different steps in the participant’s decision process. They compare the risks and benefits of multiple alternatives, determining what matters to the participant and how this aligns with the pros and cons of the alternatives, estimating the probabilities of each alternative. We will also consider which of these lessons are especially beneficial to less-literate and less-numerate participants. The central question of this paper is: what can we learn from research in the medical domain that can be applied to the pension domain to effectively support participants in making better pension decisions?

## 2. Lessons learned

In this section we describe the three lessons learned that can be used to support pension decisions (see Box 1). For each lesson, we describe a problem encountered in the pension domain and a solution for this problem derived from research in the medical domain. We substantiate why this could be a solution by reviewing the research it is based on. In addition, we give examples of how this lesson is currently being applied in the pension domain and discuss ways in which to apply this lesson further.

**Box 1.** Three lessons learned from the medical domain that can lead to better pension decisions

1. Emphasize the gist of information to help clarify to participants what it means to them.
2. Use value clarification methods to help participants determine what matters to them and how this aligns with the pros and cons of the alternatives.
3. Use simple static visual aids for better comprehension of statistics and probabilities.

## 2.1 Emphasize the gist of information to help clarify to participants what the information means to them

A key problem in the pension domain is that pension information is often poorly understood. Participants may grasp the facts but fail to fully understand what these facts mean to them, which is key to informed decision making (Reyna, 2008). In this section we highlight two causes for this.

First, as Nell (2017, p. 38) states, pension providers face “the paradox of meeting the legal obligations of complete communication on the one hand and creating clear and understandable communication on the other”. With regard to the Dutch pension providers, for example, “Policy makers have already concluded that the content and size of this type of document must be geared more towards helping individuals instead of fulfilling the legal obligation to provide correct (and complete) information.” (Debets et al., 2020, p. 17). Because of these legal obligations, an excessive amount of (recurring or non-relevant) information is provided to participants, “which may come at the expense of the findability of the information, feelings of self-efficacy, and motivation” (Nell, 2017, p. 182). In order to help participants to make better pension decisions, we should help them to derive the gist of the information provided and to clarify what it means to them.

Second, and related to the previous point, although pension statements convey correct, accurate and factual information, this information is not always meaningful

to participants (EIOPA, 2021). For example, pension providers focus on communicating how much pension income a participant can expect at retirement age. However, more important than knowing the exact amount, is to know whether this amount is likely to be sufficient. A recent evaluation of the Dutch 2015 Pension Act—which aimed to improve the information provision about pensions—(Van Waveren, Kuin & Duysak, 2019) shows that whereas half of the participants know how much pension income they can expect, only one-third know whether their expected pension income will be sufficient. According to EIOPA (2013), the provision of pension information had primarily a legal purpose. However, to solely serve a legal purpose is not sufficient, because what people need first and foremost is key information.

In the medical domain, Reyna (2008) suggested a way to make health information more meaningful to people. The underlying assumption is that in judgment and decision making, people rely on the gist of information as opposed to verbatim details. When presented with meaningful stimulus (e.g., health information on a website), they can represent this information mentally in more or less detail, ranging from gist to verbatim representations. After the information is represented, people retrieve their values, principles, and knowledge and apply these to the representations. When making a decision, people first rely on the representation with the lowest (least precise) level of gist and move up in precision if they feel that this is needed in order to make

a good decision (Reyna, 2008). Rather than providing more (detailed) information, decision support should strive to capture the essential bottom line of options, resolving trade-offs to the degree that is possible (Reyna, Nelson, Han & Pignone, 2015).

Blalock and Reyna (2016) conducted a literature review to identify studies that applied these principles to investigate health judgments and decisions. They concluded that interventions designed to facilitate gist-based reasoning often resulted in better decisions and in a better decision-making process. For instance, Fraenkel et al. (2012) developed a web-based tool to support decision making for rheumatoid arthritis patients. The first step was to conduct a survey with thirteen experts and to classify risks into those that are extremely important and must therefore be disclosed to all patients, risks that are less important and should be provided as additional information (via links for patients who are interested in this information), and risks that are deemed not important at all and therefore could be excluded from the tool (Fraenkel et al., 2012, p. 978): “This flexible approach addresses the needs of patients desiring additional information without overwhelming others”. Furthermore, the tool promoted accurate gist representations by using qualitative terms concerning treatment risks and benefits in addition to numerical information (e.g., ‘a very rare chance’ in addition to ‘3 in 1000’) and by using visual aids. Fraenkel et al. (2012), among others, showed that the tool significantly increased the clarity of values (based on three items such as ‘I am clear about which risks and side effects matter most to me’). Most importantly, the tool increased the number of patients who made an informed value-concordant choice (i.e., a choice that is based on accurate knowledge and that matches one’s values) by more than 80 per cent.

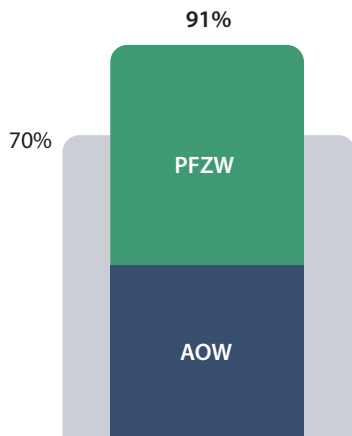
Smith et al. (2014) examined the effectiveness of a gist-based leaflet about colorectal cancer. The leaflet

presented numerical information categorically or by means of verbal quantifiers that provided an evaluative label of the number (e.g., ‘most people’ instead of ‘98 out of 100’). Furthermore, gist-based processing was encouraged by removing information deemed ambiguous or non-essential in some of their previous studies. Individuals who received the leaflet were more likely to exhibit adequate gist knowledge (i.e., whether they understood the gist of the information).

Wolfe et al. (2015) designed an intelligent tutor, BRCA Gist (BRCA Cancer Genetics Intelligent Semantic Tutoring), that applied artificial intelligence, grounded in the same principles. BRCA Gist encouraged people to form gist representations, rather than verbatim ones. It did so by presenting verbal explanations that highlight the essential decision-relevant meaning of information and by presenting figures and videos that convey the gist of core concepts, stripping away details. Wolfe and his colleagues determined the effectiveness of the intelligent tutor, and their results show that people who used the tutor performed better on measures of gist comprehension and made objectively better judgments and decisions about genetic testing. They therefore concluded that gist-based interventions can improve gist comprehension and decision making over and above that which is achievable with detailed materials.

Research by Peters, Dieckmann, Dixon, Hibbard and Mertz (2007) suggested that emphasizing the gist may be especially beneficial to less-numerate people. They conducted three studies on the presentation and formatting of numerical hospital quality information and found that people, particularly those lower in numeracy, tended to have higher comprehension and made objectively better decisions when the presentation format made the most important information easier to evaluate (e.g., by deleting non-quality information and highlighting quality information).

The medical research discussed above can help design pension information that will make it easier for pension participants to derive the gist of information and to understand what this information means to them, thereby helping participants to make better pension decisions. The research shows that this can be done in several ways. First, numerical information could be presented categorically or ordinally (e.g., no risk vs some risk, higher risk vs lower risk). Numerical information could also be presented by using verbal quantifiers. In the pension domain, this is already being done. For example, Dutch pension fund Zorg en Welzijn in a letter to a client informs them about their expected pension income not by communicating the exact amount, but by using a percentage, a verbal quantifier, and an interpretation of that percentage in conjunction with the verbal quantifier:



This is a snapshot (January 2020).

The percentage in bold is the gross percentage you can achieve.

We assume that:

- Your work situation does not change until your retirement
- You keep accruing pension with PFZW
- PFZW does not have to intervene financially, for example cutting the pensions
- U receive a full state pension (AOW)

*Pay attention: If you have lived abroad, this could be lower.*

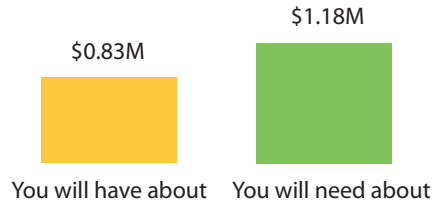
In this letter I want to inform you about the pension income that you can expect. In the Netherlands, we deem a pension income of 70 per cent of your average salary sufficient for the future. You are expected to be **well above** that. With your pension income, you can reach an income that is more than 70 per cent of your current gross salary

The letter also included the image in Figure 1. The combination of a percentage and a verbal quantifier is more meaningful to participants than the exact amount that they will receive.

This approach to pension communication is found in other countries as well. For example, in America, personal finance company Nerdwallet offers consumers the Retirement Calculator, which shows them whether they are on track for the retirement they want.

**Figure 1.** Screenshot from a letter by Dutch pension fund Zorg en Welzijn about a participant's expected pension income

## How much will you need to retire at 67?



### Retirement savings score

**Figure 2.** American personal finance company Nerdwallet's Retirement Calculator showing consumers whether they are on track for saving enough money for their retirement<sup>3</sup>



### Solid start, but let's close the gap.

You're off to the races, but have some catching up to do. Sign up For NerdWallet to get a detailed forecast, a personalized plan and notifications to stay on top of your finances.

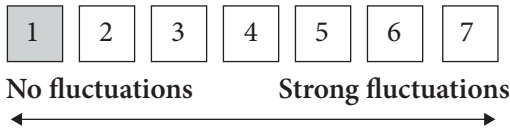
Consumers have to provide information such as their age, pre-tax income, current savings, and monthly savings (and optionally the investment rate of return, intended retirement age, life expectancy, and monthly retirement spending). The calculator then predicts their retirement saving score with a percentage and a meaningful interpretation of that percentage: 'needs attention', 'on your way', 'getting close', and 'on track' (see Figure 2).

Another example of clear and meaningful communication that conveys the gist of information in the form of verbal quantifiers is found in the Dutch standard legally required model for communication about the decision between a fixed or a variable pension income (Verbond van Verzekeraars,<sup>4</sup> 2018). According to this model, Dutch pension providers are required to communicate

the possible yearly fluctuations for the variable option (which varies by pension scheme and by provider) on a 7-point scale (to enable comparison of schemes and providers). A higher number indicates a greater chance of strong fluctuation. In addition, pension providers are required to use a verbal quantifier to provide an evaluative label of the number (e.g., considerably). Figure 3 shows what information is required to be communicated to the participant. Figure 4 shows the calculation method used to determine the number on the 7-point scale, and the current verbal quantifiers used.

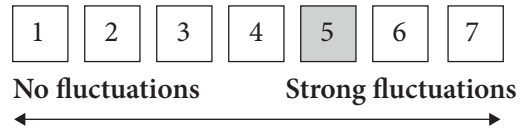
The question is whether these are meaningful verbal quantifiers to participants. Cox (2020) shows that a person's interpretation of verbal quantifiers can differ from that intended by the sender. In addition, Cox

### Fixed pension



The number 1 means that the amount of pension income is fixed. The income does not decrease or increase.

### Variable pension



The number 5 means that the amount of pension income can change considerably every year. The income can increase, but also decrease.

**Figure 3.** The fluctuations for the fixed and variable option on a 7-point scale that is required to be communicated to participants (Verbond van Verzekeraars, 2018, p. 18)

Number	Meaning	Average annual fluctuation
1	The amount of pension income is fixed	Fixed
2	The amount of pension income can change <i>hardly</i>	0% – 1,25%
3	The amount of pension income can change <i>a little</i>	1,25% – 2,85%
4	The amount of pension income can change <i>quite a bit</i>	2,85% – 4,85%
5	The amount of pension income can change <i>considerably</i>	4,85% – 7,65%
6	The amount of pension income can change <i>strongly</i>	7,65% – 12,50%
7	The amount of pension income can change <i>very strongly</i>	More than 12,50%

**Figure 4.** The calculation method used to determine the number on the 7-point scale, including the current verbal quantifiers used (Verbond van Verzekeraars, 2018, p. 19)

shows that the interpretation of verbal quantifiers may be influenced by a person’s preexisting attitudes. This indicates that verbal quantifiers (and possibly also numbers on a 7-point scale) should always be tested for interpretation by participants.

Another way to communicate the bottom-line gist of information is by resolving trade-offs to the degree that it is possible. For example, resolving a decision which involves choosing between a fixed or a variable pension income, that is choosing between a certain fixed amount

that is probably somewhat lower, and an uncertain variable amount that is probably higher, but that could also be lower than the fixed amount. Furthermore, as shown by Fraenkel et al. (2012), key decision-relevant information could be highlighted, less essential or additional information could be de-emphasized (e.g., behind hyperlinks or drop-down menus), and redundant or ambiguous information could be removed. According to EIOPA (2013), pension information should be provided in layers, with key information in the first layer and more complex, abstract and legal information in subsequent layers. Therefore, key information that should be conveyed to participants should be identified (Reyna et al., 2015). This should be done in consultation with experts and participants by asking questions such as “What information about the options is relevant and important to make this particular decision?”, “What is the essence of this decision (what is it really about)?”, and “What do the options boil down to?” (Reyna, 2018, p. 2).

In the pension domain, some of the information is already structured to meet the different information needs of the different participants. For example, since the Dutch 2015 Pension Act, pension providers in the Netherlands are obliged to provide ‘Pension 1–2–3’ to their participants. This Pension offers new and current participants general information about the specifics of their pension scheme in three layers. The first layer briefly sets out the most important information about the pension scheme, including the options available to a participant. If participants want to know more, they can proceed to the second layer, which provides more information on all the subjects dealt with in the first layer. If this information is not sufficient, the third layer can be accessed. This third layer contains very detailed information about the pension scheme, such as legal documents and financial reports. According to Nell (2017, p. 12), “the idea behind this design is that readers who have to be informed about their pension are

not immediately overloaded with information but are provided only with the basics—making the information easier to process.”

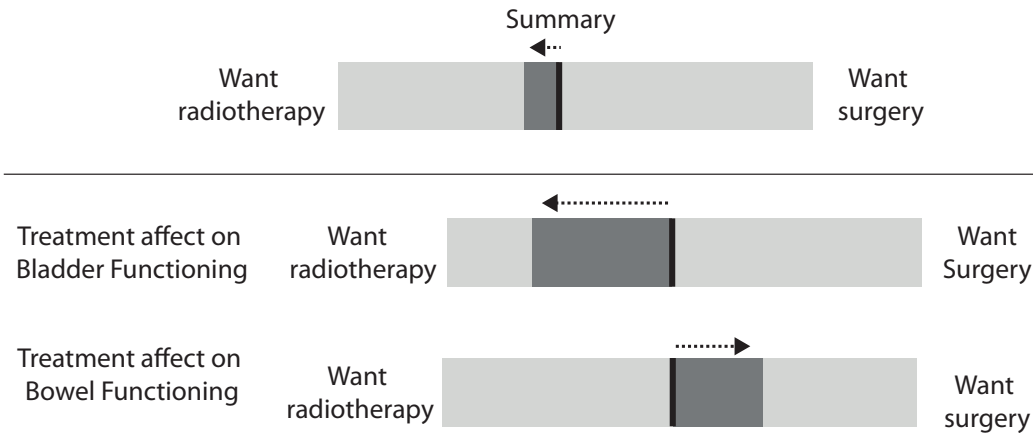
Pension 1–2–3, however, requires some improvements (Van Waveren et al., 2019). Although pension providers appreciate the substantive qualities of Pension 1–2–3, they state that the information provided does not sufficiently match the needs and characteristics of all participants. As a result, Pension 1–2–3 is hardly used by participants. According to the pension providers, layers 2 and 3 contain a multitude of documents with general information which are too detailed and too complex, and do not match personal information needs. Therefore, more empirical research is needed to gain insight into the effectiveness of Pension 1–2–3.

In conclusion, pension participants should be able to derive the gist of pension information and to understand what this information means to them without difficulty. Meaningful and clear information should be conveyed, so as to help participants to make better pension decisions. There are a number of ways in which to do this, some of which are already being used in the pension domain. More research, however, is needed to gain insight into the effectiveness of, for example, the use of verbal quantifiers and layering in pension communication. To have the gist of information emphasized would be especially beneficial to less-literate and less-numerate participants.

## **2.2 Use value clarification methods to help participants determine what matters to them and how aligns with the pros and cons of the alternatives**

Participants in a pension scheme face decisions whose outcomes are complex. Therefore, it is difficult for participants to identify which personal values should be taken into account when evaluating an alternative to the extent that it suits their preferences and circumstances.





**Figure 5.** Bar setting value clarification method used by Feldman-Stewart et al. (2012) for choosing between treatments for early-stage prostate cancer

To help participants determine what matters to them and how this aligns with the decision alternatives, value clarification methods (VCMs) can be used. These methods are intended to help people “evaluate the desirability of options or attributes of options within a specific decision context” in order to identify which option they prefer (Fagerlin et al., 2013, p. 2). The rationale is that, by clarifying people’s values, their decisions will be more in line with their personal preferences and circumstances (Fagerlin et al., 2013).

Research in the medical domain has shown that VCMs can support decision making. VCMs are often included in decision tools and are generally placed after the information section (Fagerlin et al., 2013). Feldman-Stewart et al. (2012) considered if adding a VCM had an additional benefit over well-structured information that presents attribute information on the options offered to patients choosing between treatments for early-stage prostate cancer. The VCM they used was a bar-setting

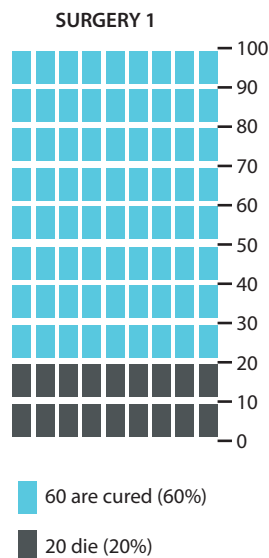
exercise (see Figure 5). In this case, the patient has to choose between surgery and radiotherapy and has to think about one attribute (e.g., effect on bladder functioning) which is related to the two treatments. The patient has to adjust a bar to reflect the impact of the attribute being considered and the attractiveness of the treatments in light of that attribute. The patient then moves on to the next attribute. The summary bar displays the average of the individual bars and the overall attractiveness of the two treatments to that patient. In the example in Figure 5, the effect of the two treatments on bladder functioning makes the patient choose radiotherapy, while the effect of the treatments on bowel functioning makes the patient choose surgery. Because the patient’s concerns about bladder functioning are stronger than their concerns about bowel functioning, the summary bar tends toward radiotherapy. Feldman-Stewart et al. used decisional conflict, preparation for decision making, and regret as outcome measures in four

occasions: after the information was used (i.e., before making an actual decision), after the decision was made, three months after completing the treatment, and twelve to eighteen months after the decision was made. While decisional conflict decreased for both conditions immediately after usage, using the information with the VCM led to patients feeling better prepared for decision making, and to less regret. However, this impact only emerged after the decision regarding the treatment had been made.

Fagerlin et al. (2013) reviewed thirteen studies that compared the effects of decision tools with and without VCMs. These methods differed in terms of decision context (e.g., treatment, prevention, screening), medium (e.g., paper, computer, face to face), type (e.g., considering pros versus cons, prioritization, rating scales) and dependent variables (e.g., knowledge, decision-making processes, decisional conflict). Fagerlin et al. conclude that inclusion of some, but not all, VCMs led to improved decisions. They also observed that inclusion of VCMs did not lead to worse outcomes in any of the cases.

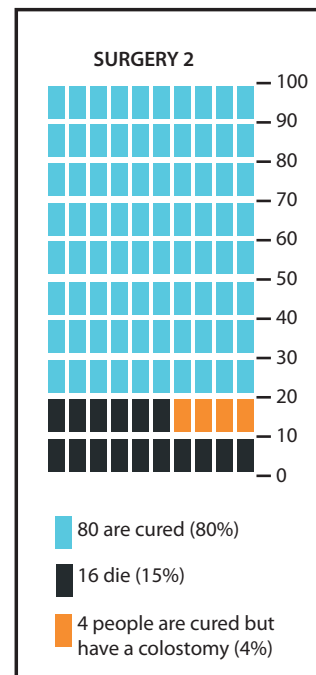
Witteman et al. (2020) noted that, while it is agreed that VCMs are intended to support value-congruent decisions, evaluation as to whether they reach that goal is seldom conducted. Witteman and his colleagues have therefore identified eleven VCMs and tested their effects on value congruence and decisional conflict across six experiments for the same (hypothetical) decision between two different surgical treatments for colon cancer. One treatment had a lower mortality rate, but, compared to the other treatment, it carried the additional risk of a serious complication: a colostomy. In all studies, participants first learned what a colostomy is; they were then offered one of the eleven VCMs (or assigned to a control group) and had to answer one or more questions. The results showed that commonly used VCMs, such as pros-and-cons lists and rating scales, reduced decisional conflict, but did not lead to

### Your Choice



I would choose Surgery 1

### Recommended for You



I would choose Surgery 2

**Figure 6.** Static display shown after an incongruent choice between two different surgical treatments for colon cancer (Witteman et al., 2020, p. 269)

more value-congruent decisions. Methods that explicitly showed people how well or how poorly different options aligned with their values not only supported them in making more value-congruent decisions but also reduced decisional conflict. Examples of these methods include a static display shown after making an incongruent choice, which provided people with feedback after their choice did not align with their values (see Figure 6),

and an interactive interface showing the fit between values and options along with the trade-offs inherent in the decision (see Figure 7). The static display is better suited for relatively simple decisions, the outcomes of which can be depicted in a single pictograph. The dynamic, interactive interface can be applied in more complex decision contexts.

To sum up, research has shown that the use of VCMs in medical decision making, leads to better prepared decision making, reduced decisional conflict and regret, and, most importantly, to more value-congruent decisions. However, different VCMs have different beneficial

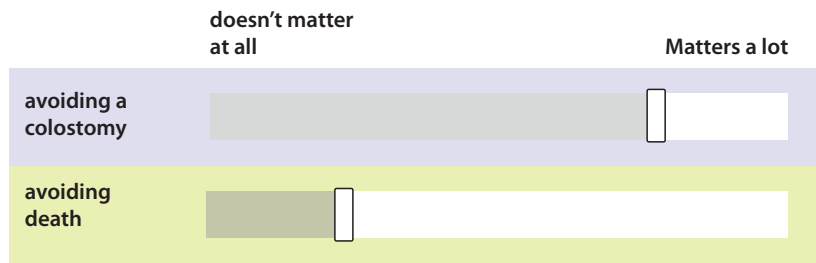
effects. So far, no single method has proven to lead to all beneficial outcomes. Therefore, it is important to decide which outcome is desired most in order to determine which method is suitable and, subsequently, whether this method could be applied in the decision context being considered (e.g., static displays are less suitable in more complex decision contexts). In addition, it is important to note that VCMs are usually not applied as standalone tools but are included in decision tools or are preceded by information about the options or attributes of options.

In both the Dutch and the international pension domain, methods that could be considered as VCMs

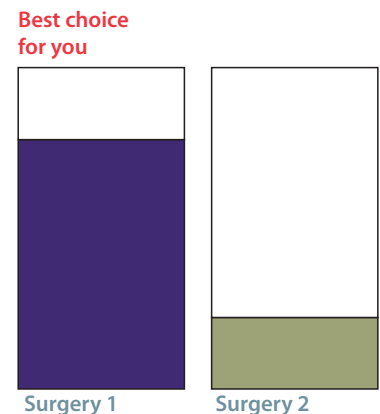
## What is important to you

Before you make the choice between the two surgeries please take a moment to consider what is important to you. Play with I've sliders below while you consider your feelings. Remember that there are no wrong answers. Please stay on this page for at least 20 seconds.

### What matters to me for this decision



### What's best for me



**Figure 7.** Interactive interface showing the fit between values and options along with the trade-offs inherent in the decision between two different surgical treatments for colon cancer (Witteaman et al., 2020)

are already being used. For example, in Britain, life assurance company Standard Life offers consumers a tool to compare different ways to receive their pension money. This tool allows consumers to set their preferences and see how these align with the options, in order to find an option that is right for them (see Figure 8). In the Netherlands, pension fund ABP offers a decision tool for the decision to keep working or retire early; here participants are asked to rate the importance of each decision attribute (see Figure 9). Dutch pension fund APF, on the other hand, offers a decision tool to help participants decide between a fixed or a variable income; here participants are presented with questions to help them weigh the different attributes of the option (see Figure 10).

The VCMs we have encountered are not very dynamic, interactive VCMs. A more interactive version of the VCM shown in Figure 7 above, for example, could look like the one shown in Figure 11. This more dynamic version of the tool explicitly shows participants how well or how poorly different options align with their values. Such a tool would better support participants in making value-congruent decisions and, as a result, reduce decisional conflict. Because the use of VCMs in the pension domain is still limited, further research on the use and effectiveness of VCMs for pension decisions is recommended.

Which options do you want to sort?

Taking cash    **Setting up an income**    Leave it for now

Would you prefer your income to be guaranteed for life?

**Yes, guaranteed**    No, stay invested    Little of each

Is it important you can dip into your pension or adjust your income?

Important    **Not needed**    Maybe

How do you want to spread out your retirement income?

More early on    **Evenly spread**    Not sure

Reset

Here are some options on how to use your pension pot:

**Guaranteed income for you**

Guaranteed income for life (annuity)

Guarantee income for the rest of your life

- ✓ Guaranteed for life
- ✓ Set up, sit back & relax
- ✓ An income just for you, not for your spouse or partner
- ✓ It's not flexible - once set up you can't normally change your income

Tell me more

**Guaranteed income for two**

Guaranteed income for life (annuity)

Guarantee income for two...you and your partner

- ✓ Guaranteed for you or partner's lives
- ✓ Protects your partner when you die
- ✓ Set up, sit back & relax
- ✓ It's not flexible - once set up you can't normally change your income

Tell me more

**Figure 8.** Tool offered by British life assurance company Standard Life to compare different ways to receive the pension money<sup>5</sup>

**My retirement feeling**

I am looking forward to my retirement Not important   Neutral   Important

I want more time for fun things, like study, my hobbies, travelling, family and friends      

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**My money**

It is better to keep working, because of the money Not important   Neutral   Important

My fixed expenses are high, or I want to be able to spend money on vacations and other fun things      

**Figure 9.** Part of the decision tool offered by Dutch pension fund ABP for the decision to keep working or retire early<sup>6</sup>



TIP Making the best decision in your situation? Ask yourself the following questions:

- ▶ Do I think it is important to know how much pension income I will receive per month for the rest of my life?
- ▶ Do I think it is important to know how much pension income my partner will receive when I die?
- ▶ How important is it to me that my pension income increases with the increasing prices?
- ▶ Can I make ends meet if my pension income does not increase with the increasing prices?
- ▶ Can I pay my fixed expenses if my pension income decreases due to disappointing investments?
- ▶ Do I want to run more investment risk in exchange for an expected higher pension income?
- ▶ Does it make a big difference for my total income and expenses if I receive more or less pension income?

**Figure 10.** Questions suggested by Dutch pension fund APF to encourage participants to consider different attributes of the decision between a fixed or a variable pension income<sup>7</sup>

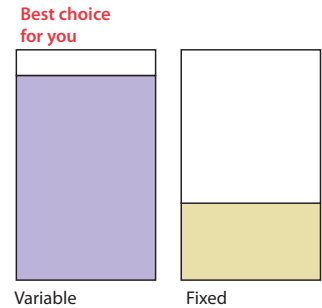
## What is important to you

Before you make the decision between a fixed or a variable pension income please take a moment to consider what is important to you. Use the sliders below while you consider your feelings. Remember that there are no wrong answers. Please stay on this page for at least 20 seconds.

### What matters to me for this decision



### What's best for me



**Figure 11.** Possible (simplified) interactive VCM showing the fit between values and a fixed or variable pension income<sup>8</sup>

### 2.3 Use simple static visual aids for better comprehension of statistics and probabilities

Information intended to support pension decision making often involves statistics and probabilities. This could be problematic because most individuals find it difficult to process and accurately evaluate statistics and probabilities (Barratt et al., 2005). Research in the medical domain has shown that visual aids could be used to effectively communicate statistical information and probabilities. This could be beneficial for decision making in a number of ways, and research indicates that some forms of visual aids are more beneficial than others.

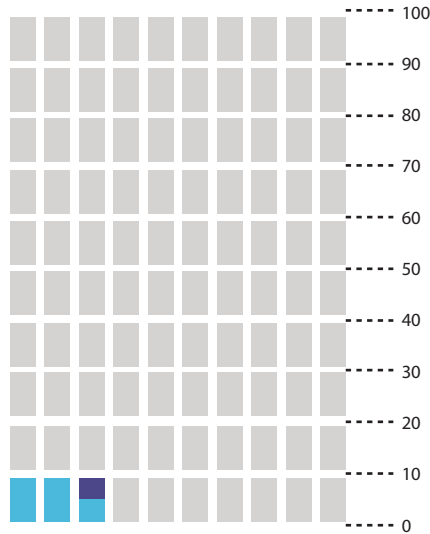
Tait et al. (2010) examined the understanding of graphical presentations of risks and benefits. Their results show that pictographs are superior to text in promoting understanding (both gist and verbatim), especially where less-numerate and less-literate people are concerned.

Fagerlin et al. (2011) recommend using pictographs (see Figure 12) to communicate risk and benefit information. According to them, a growing body of

research suggests that these are better and more quickly understood than other graphical formats. For example, Hawley et al. (2008) evaluated the ability of six graph formats to impart knowledge about treatment risks and benefits and found that pictographs were the best format for communicating probabilistic information because these led to adequate levels of both gist and verbatim knowledge (based on correct answers on knowledge questions), especially for less-numerate individuals.

Studies on visual aids show that simpler formats of pictographs (see Figure 13) lead to greater accuracy in reporting chance of survival, and are therefore evaluated better (based on questions such as how well the graph describes the benefits of different additional treatments) compared to more complex pictographs (Zikmund-Fisher, Fagerlin & Ubel, 2010). In addition, interactive risk graphics are more likely to distract people from a task (and thus from understanding) and can even make them stop performing a task (Zikmund-Fisher, Dickson & Witteman, 2011), compared to static risk graphics. Moreover, animated forms of pictographs do not lead

**Figure 12.** Pictograph to communicate risk information (Fagerlin et al., 2011, p. 1438). This pictograph highlights the additional risk of cataracts faced by women taking tamoxifen compared with the baseline risk for women of the same age. Each rectangle represents 1 out of 100 individuals

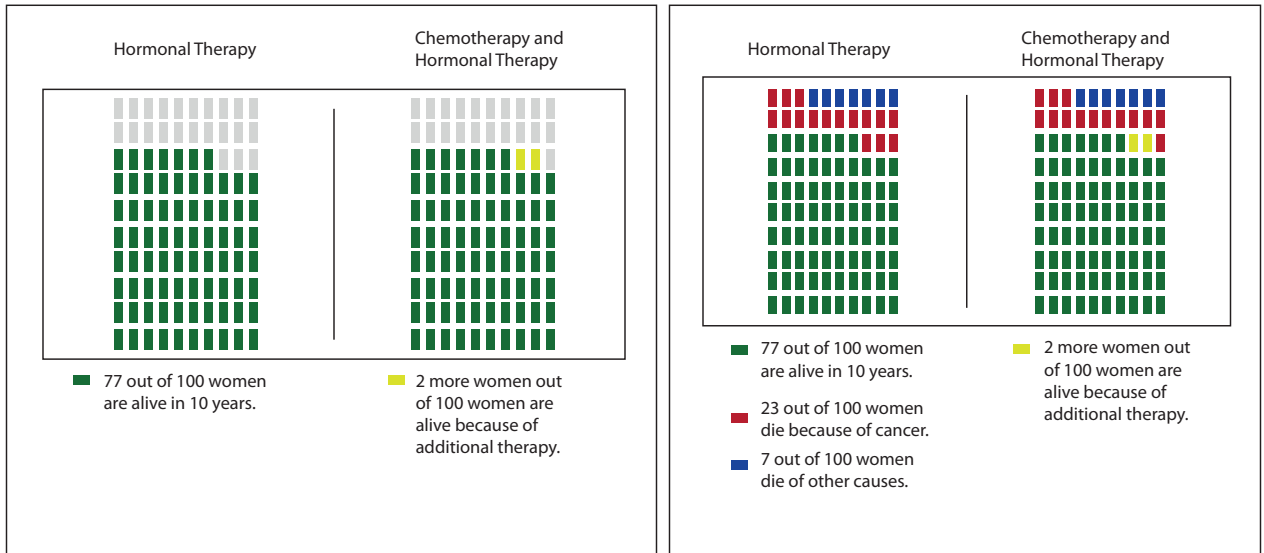


**Cataracts**

*Cataracts* make one or both eyes cloudy, and make it hard to see.

Among 100 women your age who **did take tamoxifen...**

**■ The additional risk caused by taking tamoxifen:**  
 0.4 **more** women out of 100 (0.4%) would now get cataracts.

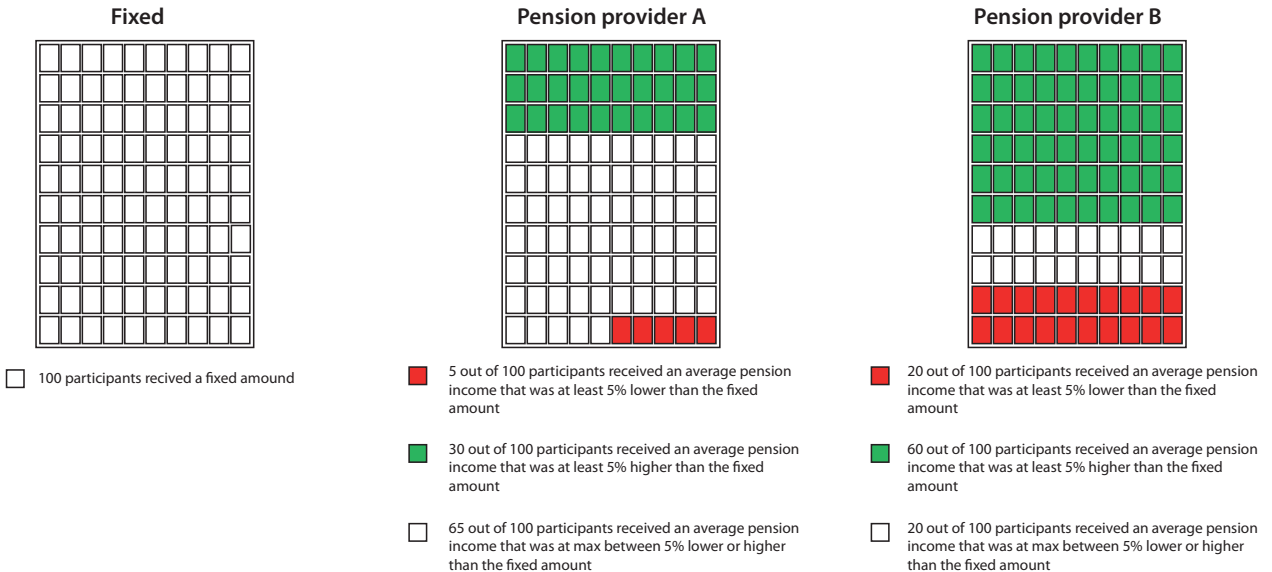


**Figure 13.** Simpler and more complete pictograph reporting chance of survival for different treatments (Zikmund-Fisher et al., 2010, pp. 662, 665)

to higher accuracy in terms of knowledge and choice. In fact, most types of animations lead to worse outcomes compared to static pictographs of the same risks (Zikmund-Fisher et al., 2012).<sup>9</sup>

Visual aids are also being used in the pension domain. However, research on the effectiveness of visual aids in the pension domain is still limited (but see Cox & De Goeij, 2020, on the positive effect of infographics on better investor decisions). In line with what we know from the medical domain, Figure 14 can be considered as a good example of how statistics in the pension domain could be conveyed. The possible yearly fluctuations (and therefore, risks) for a variable pension income vary between pension providers. To compare providers for this decision, a visual aid such as the one in Figure 14 could be used. Here we see that 5 out of 100 participants

who have a variable pension from provider A received an average pension income that was at least 5 per cent lower than the fixed amount (compared to 20 participants from provider B); 30 out of 100 received an average pension income that was at least 5 per cent higher (compared to 60 participants from provider B); and 65 out of 100 received an average pension income that was only slightly (no more than 5 per cent) lower or higher (compared to 20 participants from provider B). This visual aid is in line with knowledge about visual aids from the medical domain only. More research needs to be conducted on the effectiveness of simple static visual aids in the pension domain, because these could have a positive effect on the comprehension of statistics and probabilities, especially for less-numerate and less-literate participants.



**Figure 14.** Visual aid showing statistics for the decision between a fixed or a variable pension income between two providers<sup>10</sup>



### 3. Discussion

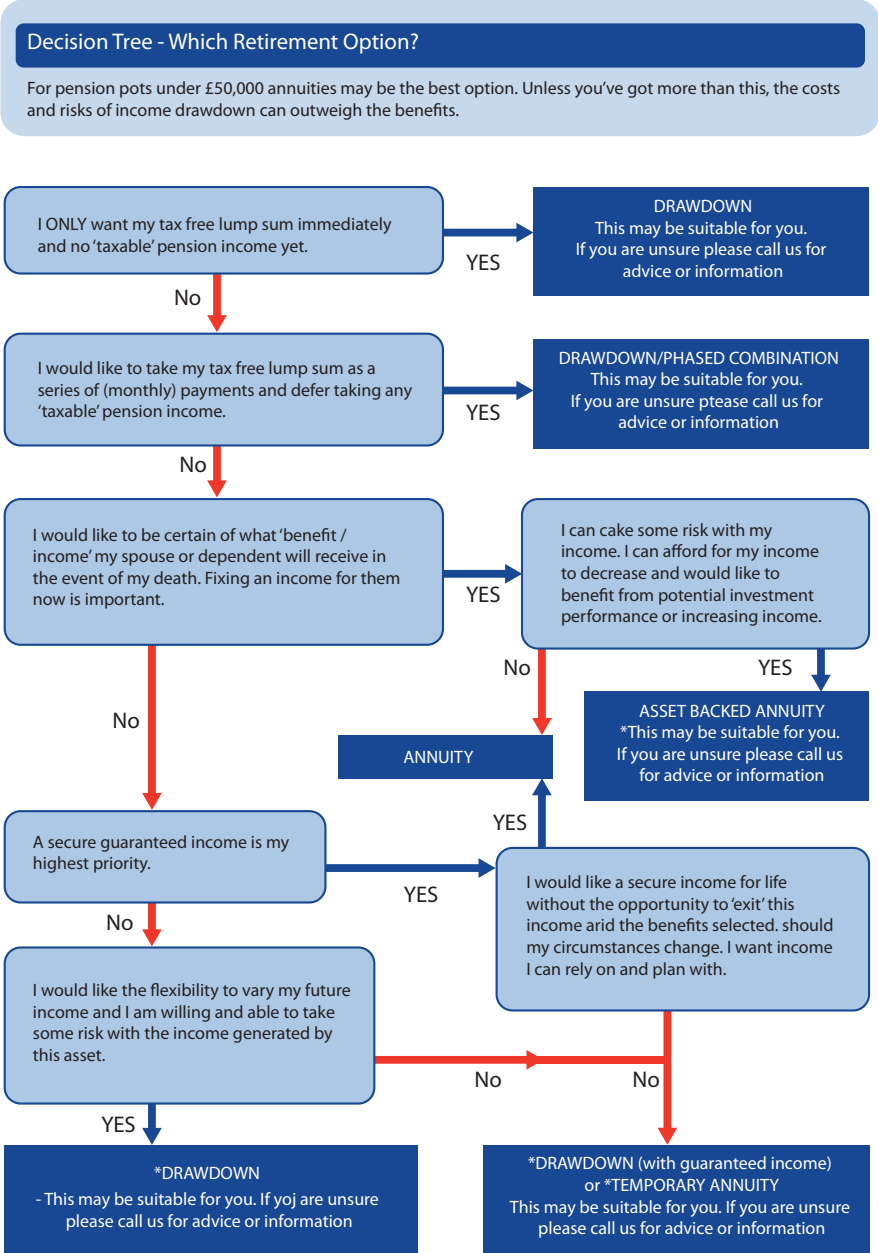
In this paper we have described three lessons learned from the medical domain which can be applied to the pension domain to effectively support participants in making better pension decisions. First of all, we should help participants to derive the meaningful representations of the alternatives they have to choose from by emphasizing the gist of information. Second, we should help participants to determine what values matter most to them and how these align with the alternatives presented. Third, we should use simple static visual aids to help participants better comprehend statistics and probabilities. Emphasizing the gist of information and using simple static visual aids in pension information intended to support decision making could be especially beneficial to less-literate and less-numerate participants.

#### 3.1 Limitations

We argued that knowledge from the medical domain is relevant for the pension domain. There are, however, differences between decisions in the medical domain and those in the pension domain. For instance, because they often have to do with immediate health consequences, decisions in the medical domain often evoke stronger emotional reactions and are often more urgent than decisions in the pension domain. These differences, however, pertain more to the urgency of the context in which people need to make a decision. Given the long-term financial consequences that pension decisions have, empowering people to make better pension decisions can be as important as helping them make decisions in the health context.

#### 3.2 Future

This paper offers new, evidence-based perspectives on the presentation of pension information that is intended to support decision making. A next step could be to conduct interviews with both pension consultants and participants to learn more about the considerations, values, and information that are important for pension decisions. These interviews would help identify the gist of different pension decisions, and which values should be included in a value clarification method. The information from these interviews, together with the lessons discussed in this paper could be incorporated in pension decision tools. Research in the medical domain has shown the beneficial effects of decision tools on decision making. However, the different variations of the three lessons and their implementation in decision tools need to be verified—for example, the effectiveness of verbal quantifiers and layering in pension communication, the effectiveness of different VCMs, and the effectiveness of different visual aids. These could be tested separately or combined (e.g., conveying the gist by using visual aids, using a visual aid in a VCM). The effectiveness of decision trees or testimonials should also be investigated. Although these are suggested as possible decision support interventions in the medical domain (Elwyn, Stiel, Durand & Boivin, 2011), and are already being used in the pension domain (e.g., Figure 15), where their benefits have been recognized (Knoll, 2011), their benefits are more ambiguous and should therefore be verified. This would lead to the further improvement of pension decisions, which would be beneficial to both participants and society as a whole.



**Figure 15.** Decision tree offered by British financial adviser Simply Retirement to support consumers in choosing the best retirement option<sup>11</sup>

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### Notes

1. The Dutch Authority for the Financial Markets (AFM)
2. European Insurance and Occupational Pensions Authority
3. <https://www.nerdwallet.com/investing/retirement-calculator>
4. The Dutch Association of Insurers
5. <https://www.standardlife.co.uk/retirement/tools/compare-retirement-options>
6. <https://werkknemer.keuzehulppensioen.nl/>
7. <https://www.pensioenfondsapf.nl/-/media/sites/pensioenfondsapf/downloads-pensioenfondsapf/formulieren/apf-beschikbare-premieregeling-keuzehulp-stabiele-of-variabele-uitkering.pdf>
8. Own design.
9. The beneficial effects of simple visualizations have been shown in other domains as well, for instance the climate domain (Kause, Bruine de Bruin, Fung, Taylor, and Lowe, 2020).
10. Own design.
11. <https://www.simply-retirement.co.uk/wp-content/uploads/2012/11/Simply-Retirement-PD-forms.pdf>

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