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Abstract

Well-being is a multidimensional concept. In addition to income, people care about non-monetary dimensions, like health and housing quality. To determine how a society is doing in this regard, it is important to consider both the distributions across these various dimensions and the dependence between dimensions. Do the same people score low on all dimensions, or do some score high on some dimensions and low on others? I say that individuals who occupy a low position on all dimensions of life at the same time, suffer from cumulative deprivation. The position of these individuals is particularly precarious, as a low score on one dimension is further reinforced by low scores on other dimensions. In this article, we chart cumulative deprivation in Belgium, based on the MEQIN dataset: a broad dataset containing detailed information on various dimensions of life (e.g., income, health and housing quality for a random sample of Belgians in 2016). Walloon women who are not in a relationship and who have not completed secondary education are particularly likely to suffer from cumulative deprivation. Finally, the discussion addresses several channels along which deprivation can accumulate across dimensions.

Key words: Cumulative deprivation, multidimensional well-being.

1   Introduction

A broad consensus holds that well-being can best be regarded as a multidimensional concept (Stiglitz et al. 2009). In addition to the monetary aspects of their well-being (e.g., income, consumption and wealth), people care about many other aspects, including their health and the quality of their housing. The measurement of well-being requires considering its multidimensional character. There are roughly two multidimensional approaches to the measurement of the well-being of an entire society.

The first approach consists setting up a *dashboard* of indicators. This approach was used by the United Nations for the Millennium (or Sustainable) Development Goals, as well as by the European Commission in the construction of the 18 'Laeken indicators' (Atkinson et al. 2002). Like a pilot in the cockpit, policymakers and researchers see a variety of monetary and non-monetary indicators on a single dashboard. Even though such a dashboard provides interesting, policy-relevant information on each dimension separately, it does not provide any clear answer to questions concerning the overall state of well-being in the society as a whole.

Moreover, a dashboard does not take the dependence between the dimensions into account (Decancq, 2014). To illustrate this, we compare two fictive societies in Figure 1. Each of these societies consists of only two people: Robinson and Friday. For this example, we further assume that well-being can be measured according to only two dimensions of life: Dimension A and Dimension B. The two societies differ in one respect: the dependence between the dimensions. In Society 1, Friday scores high on the first dimension, with Robinson scoring low, while Robinson scores high on the second dimension, and Friday scores low. In the second society, Robinson scores high on both dimensions, with Friday scoring low. These are clearly different societies. Robinson would likely prefer to be shipwrecked in the second society, while Friday would choose the first society. Approaches based on a dashboard are not able to distinguish the difference between the two societies, however, because the shape of the distribution of each dimension is identical in both societies.

A second approach to charting multidimensional well-being therefore involves constructing a multidimensional *well-being index*, which brings the various life dimensions of individual people together in a single measure. Examples of such well-being indices include the Human Development Index of the United Nations Development Programme and the Better Life Index of the OECD. As shown in Figure 1, a well-being index can reveal the difference between the two societies. The well-being index reflects more inequality in the second society. Whereas high and low scores on the various dimensions 'compensate' for each other in the first society, such is not the case in Society 2. At the same time, however, the construction of a well-being index is not a simple task. For example, weights must be assigned to the various dimensions. In many cases, however, the choice of these weights is arbitrary.[3] Moreover, a broad, rich dataset is needed in order to calculate a well-being index, as it requires information on the outcomes in the various dimensions for exactly the same individuals. In contrast, the dashboard approach offers the advantage of allowing the use of the most specialised dataset for each dimension.

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[3] Decancq and Lugo (2013) provide a critical overview of a variety of methods for establishing the weights in a multidimensional benchmark. Decancq and Schokkaert (2016) propose a method that takes into account the preferences of the people involved concerning what they consider important in their own lives.

Figure 1. Two fictive societies

Society 1	Dim. A	Dim. B		Society 2	Dim. A	Dim. B
Robinson	10	90	Robinson		90	90
Friday	90	10	Friday		10	10

In this article, we examine in greater detail the fundamental difference between the two societies, as revealed in Figure 1: Dependence between the life dimensions. To this end, we define the phenomenon of *cumulative deprivation* and describe how it can be quantified. Cumulative deprivation occurs when some people occupy a low position on all dimensions of life at the same time. Although there is no cumulative deprivation in Society 1, Friday suffers from cumulative deprivation in Society 2.

There are at least two reasons why it would be useful and interesting to address the phenomenon of cumulative deprivation in greater detail. First, an analysis of cumulative deprivation could make it possible to provide insight into the blind spot of dashboard approaches by explicitly charting the dependence between the life dimensions. Second, the dependence between the dimensions plays an important role in the multidimensional theory of justice developed by Michael Walzer (1981) and the capability approach developed by Amartya Sen (1985, 2009). Walzer (1981) defines a 'complex egalitarian' society as a society in which there is no systematic dependence between the various dimensions of well-being (for a discussion of this point, see also Miller, 1995). Walzer uses the metaphor of a society with impenetrable barriers between the dimensions of well-being, such that a high position on one dimension cannot be used to achieve a high position in other dimensions. In the 'Idea of Justice', Sen (2009) describes the importance of 'coupling disadvantages' for the capability approach:

There can also be some 'coupling' of disadvantages between different sources of deprivation, and this can be a critically important consideration in understanding poverty and in making public policy to tackle it. Handicaps, such as age or disability or illness, reduce one's ability to earn an income. But they also make it harder to convert income into capability, since an older, or more disabled or more seriously ill person may need more income (for assistance, for prosthetics, for treatment) to achieve the same functioning (even if that achievement were, in fact, at all possible). Thus real poverty (in terms of capability deprivation) can easily be much more intense than we can deduce from income data (Sen, 2009 p. 256).

The dependence between the various dimensions also plays an important role in the measurement of multidimensional poverty and relative deprivation (Ferreira and Lugo, 2013). The measurement of cumulative deprivation nevertheless differs from the measurement of multidimensional poverty or relative deprivation. Such measures (e.g. the popular multidimensional poverty measure proposed by Alkire and Foster, 2011) are used to examine how many people score lower than a specific threshold value on each dimension. In contrast, cumulative deprivation measures the number of people occupying a low position on all dimensions of well-being at the same time. The measurement of cumulative deprivation therefore does not require selecting a threshold value for each dimension. Only

the dependence between the position on both dimensions matters, and not the levels achieved on each dimension. An analysis of cumulative deprivation thus constitutes more of a complement to existing approaches than it does a replacement for them.

For the purposes of this article, we use the MEQIN ('Measuring Equivalent Incomes') dataset. These data, which were collected in 2016, allow us to describe how people are doing according to various dimensions of life (e.g. income, health and housing quality). In their book, Capéau et al. (2018) provide an overview of the initial research findings based on the MEQIN dataset. The objective of this article is therefore to examine the findings reported in Chapter 20 of that book in greater detail, using the array of instruments recently developed by Decancq (2020).

The article is structured as follows. In Section 2, we introduce the MEQIN dataset and the selected life dimensions. This is followed by Section 3, in which we define the phenomenon of cumulative deprivation and propose a simple figure that can be used to quantify cumulative deprivation. In the fourth section, we describe the social-demographic profile of people suffering from cumulative deprivation. We then discuss several channels along which deprivation can accumulate across the various life dimensions (Section 5). The conclusion of the article is presented in Section 6.

2   Data and Dimensions

2.1   The MEQIN dataset

The MEQIN data were collected by a consortium of researchers from the UCLouvain, KU Leuven, the Université libre de Bruxelles and the University of Antwerp, using financial support from the Belgian Science Policy Office (BELSPO). The objective of the MEQIN project was to collect an innovative dataset that would allow for the measurement of well-being and poverty within a multidimensional framework for a random sample of Belgians.[4]

The target population of the MEQIN survey consists entirely of adults living in Belgium. To reach this population, a random (stratified) sample was drawn from the Belgian National Register, with geographic clustering.[5] The stratification into 14 demographic groups was based on household composition and the age of the head of the household, such that individuals in strata with one-parent families and a head of household older than 60 years were more likely to be designated for selection. For this reason, all analyses in this article use the appropriate sample weights.

The survey was conducted by the Kantar survey agency between February and July 2016 through face-to-face interviews, in which a professional interviewer visited the respondents in their homes. Interviews were conducted with all adult members of the selected families. In addition, one member of the household received a longer questionnaire containing questions about the household and the home. In all, 3,404 adults in 2,098 families completed the questionnaire (a response ratio of approximately 40%). A supplementary ('drop-off') questionnaire yielded additional information about

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[4] The data are available to researchers. Additional information on the MEQIN dataset can be found at https://sites.google.com/view/meqin.

[5] For practical reasons, the sample does not include individuals entered in the Waiting register (for aliens) or individuals younger than 60 years of age living in collective institutions.

more than 481 children in 286 families. In an article by Decancq et al. (2020), we present a multidimensional analysis of child poverty, based on the data from this drop-off questionnaire.

Belgium already has very many high-quality studies on the distribution of various dimensions of well-being. A few examples include the *Survey on Income and Living Conditions* (SILC), the *Health Survey* conducted by Sciensano and the Belgian *Housing Survey*. Other questionnaires focus more on sub-groups, as with the adults older than 50 years of age in the *Survey of Health, Ageing and Retirement in Europe* (SHARE). The most prominent contribution of the MEQIN survey is that information on several important life dimensions (e.g. income and expenditures, health, leisure time, housing quality and employment) was collected for exactly the same individuals in a single survey, such that they can be analysed together. In this regard, it is important to bear in mind that the breadth of a survey inevitably comes at the expense of its depth.

In other words, it reduces the extent of detail at which the information can be collected within each dimension of life. The MEQIN dataset can thus be regarded as a complementary instrument within the landscape of existing surveys.

2.2 Three life dimensions

This article focuses on three life dimensions: income, health and housing quality. The latter two dimensions are multidimensional concepts, each consisting of five sub-dimensions (see Table 1). The choice of these three life dimensions was partly pragmatic, based on the dimensions that could be described in detail according to the MEQIN survey. Without a doubt, however, an exclusive focus on these three dimensions cannot do justice to the multidimensional character of well-being. For example, the philosopher Martha Nussbaum (2000) proposes a more extensive list of 10 dimensions (see Decancq and Schokkaert, 2016). At best, these three dimensions of life offer a starting point for a broader analysis that extends beyond the monetary dimension.

Table 1. Dimensions and sub-dimensions

Dimension	Sub-dimensions
Income	Equivalised disposable income
Health	General health
	Functional disabilities
	Chronic illnesses
	Emotional well-being
	Physical well-being
Housing quality	Housing characteristics
	Living environment
	Proximity to services
	Sense of security
	Social relationships in the environment

The rest of this section is devoted to describing exactly how the three dimensions were measured. More detailed information is available in Chapters 4, 6, and 11 of Capéau et al. (2018).

The first dimension is *income*. We define a households 'disposable income' as the net monthly earned income of all household members, combined with all dividends/benefit payments, transfers, pensions and proceeds from capital and investments. The greater a households disposable income is, the more material prosperity it will be able to achieve. Given that it is easier for a small household to live on a certain amount than it is for a large household, it is important to correct for household size. The available household incomes were therefore corrected for household size using the standard 'modified OECD equivalence scale'. This equivalence scale assumes that €1 in the wallet of a single person produces the same amount of material prosperity as €1.50 in the wallet of a couple. This is because a couple does not have to buy everything twice, and they can share goods (e.g. the bathroom, central heating, television set) in order to achieve the same level of material prosperity as a single person. More generally, the OECD equivalence scale is calculated by assuming that, for every €1 that a household needs for the first adult, it will need an additional €0.50 for each household member 14 years of age or older, and €0.30 for each child in the household younger than 14 years of age. We refer to the corrected disposable income obtained through this procedure as the 'equivalised disposable income'.

The second dimension is *health*, which is also a multi-faceted concept. In the MEQIN questionnaire, these facets can be summarised into five sub-dimensions: general health, functional disabilities, chronic illnesses, emotional wellness and physical wellness. Each sub-dimension is measured according to different questions, which are summarised into a single scale, with a score of 100 indicating that an individual has 'maximum health' on that sub-dimension. The sub-dimension of general health is captured by questions including the following: 'In general how would you rate your health?' and 'Do you become ill more easily than other people do?'. The questions for the sub-dimension of functional disabilities assess possible functional disabilities that people experience in daily life. The sub-dimension of chronic illnesses is assessed by asking about the presence of any long-term illnesses, chronic conditions or disabilities. In addition to their existence, the impact of chronic illnesses on the respondent's activities is considered in the score. The sub-dimension of emotional wellness is intended to assess how people have felt during the most recent four weeks by asking about life energy, nervousness and depression. Finally, the sub-dimension of physical wellness combines questions about physical wellness and pain.

The third dimension, *housing quality*, is also measured according to five sub-dimensions, which are summarised into an index ranging from 0 to 100. The first sub-dimension focuses on characteristics of a households housing (e.g. problems with dampness or lack of space). The living environment is described in a second sub-dimension by asking about such aspects as vandalism and the quality of public infrastructure. A third sub-dimension assesses the proximity of services (e.g. schools, supermarkets and public transport). The fourth sub-dimension concerns the sense of security in the neighbourhood. Finally, the social relationships in the environment are captured in the fifth sub-dimension of housing quality.

The analyses in this article are based on data from only those respondents who provided the necessary

information for all sub-dimensions. This ultimately resulted in a dataset of 1,400 individuals.[6]

3 How much cumulative deprivation is there in Belgium?

We say that individuals who occupy a low position on all dimensions of life at the same time suffer from cumulative deprivation. To measure cumulative deprivation, we use the array of instruments proposed by Decancq (2020), with a particular focus on the cumulative deprivation curve. In this section, we describe how this curve can be easily constructed and interpreted.

In the first step, we assign a position on each life dimension to each person. This position is described in terms of the percentile rank p, a figure ranging from 0 to 100, which indicates the percentage of the society occupying a position lower than that of the individual in question. For example, a poor person occupies a low position on the income dimension (i.e. only a few people have a lower income than this person, who therefore belongs to a low income percentile), while a millionaire occupies a high position (i.e. this person belongs to a high income percentile). The person exactly in the middle of the income distribution has a percentile rank of 50. An individual's position does not provide any information about how poor or rich that person is. It refers only to the individual's position relative to others in the society. However prosperous a society might be, some individuals will always occupy a low position. Similarly, each person also occupies a position on the other non-monetary dimensions of well-being: a person with a chronic illness occupies a low position in health, while a top athlete occupies a high position. A small, damp studio occupies a low position on the dimension of housing quality, while a spacious villa in a good neighbourhood occupies a high position.

The 'cumulative distribution functions' for the three dimensions are presented in the three panels of Figure 2. The absolute level on the dimension in question is displayed along the horizontal axis of each panel. The position is displayed along the vertical axis of each panel. The income dimension is displayed in the upper panel, with the health dimension in the middle panel and housing quality in the lower panel. As shown in the upper panel, an individual with an disposable income of €1,000 per month is positioned around the 15th percentile. This means that 15% of all Belgians have to live on less than €1,000 per month.[7] To measure cumulative deprivation, the position of each individual on the dimensions of well-being is important. These positions are also displayed along the vertical axes of the three panels in Figure 2.

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[6] The attrition is largely due to missing data for some income components. This attrition is probably not random, and caution is therefore advised when interpreting these results and generalising them to the population.

[7] To measure poverty (i.e. 'At Risk Of Poverty' or AROP), the poverty threshold was established at 60% of the median disposable income. For the MEQIN dataset, this poverty threshold translates to €972 (see also Capéau et al. 2018, Chapter 5). According to this dataset, therefore, the at risk of poverty measure for Belgium in 2016 amounted to 15% (which is slightly below the figure based on the SILC).

Figure 2. Cumulative distribution functions for disposable income (top), health score (middle) and housing quality (bottom) (Data: MEQIN)
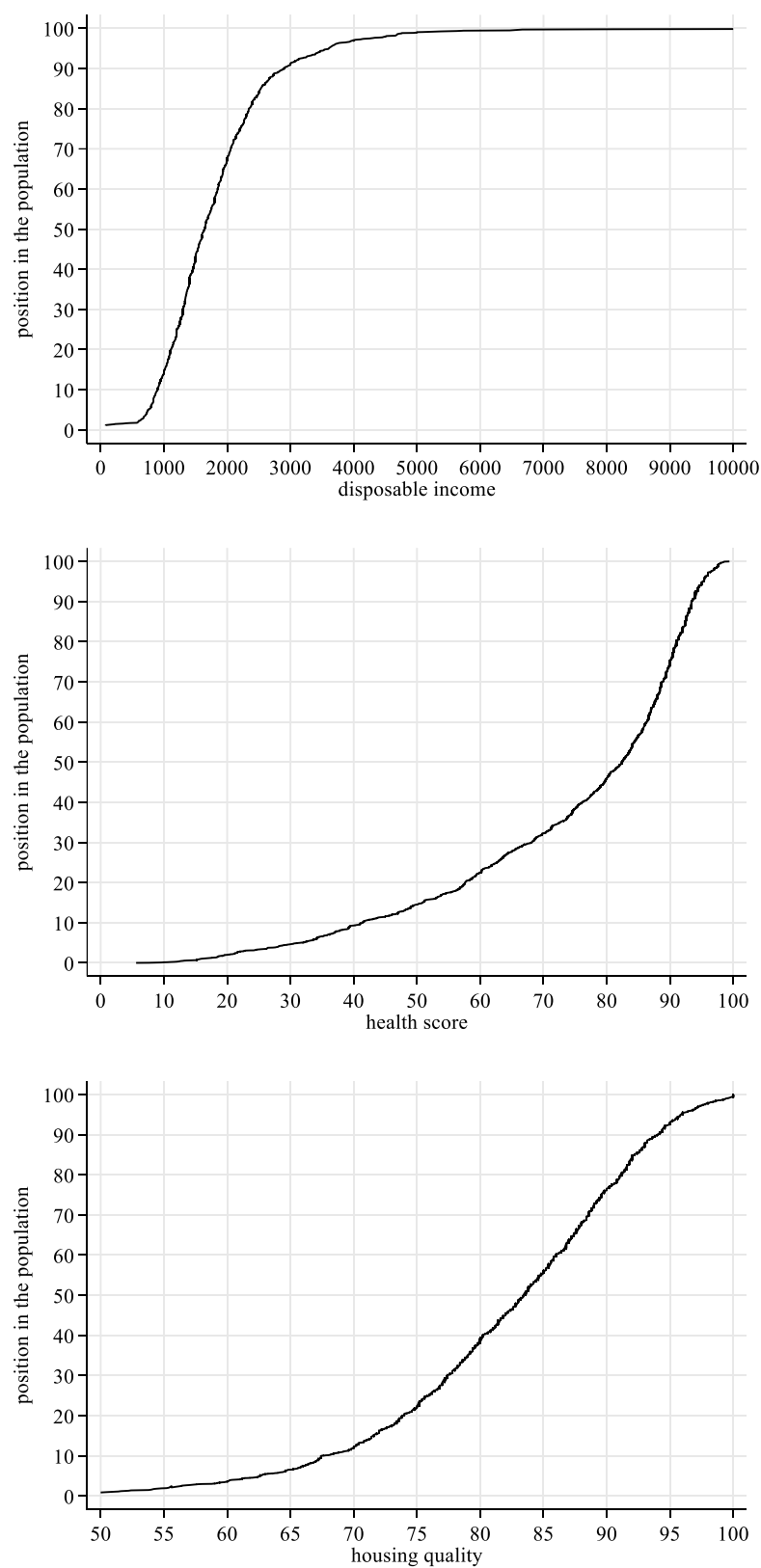
The positions of an individual on all dimensions are summarised using a position vector. This position vector comprises an individual's position in a given dimension of life (in this case, income, health and housing quality). An individual with a position vector of (0,0,0) occupies the lowest position for all dimensions, and an individual with a position vector of (100,100,100) occupies the highest position for all dimensions.

We use the term 'maximum position' to refer to an individual's highest position across all dimensions of the position vector. For example, the position vector for an individual at the 10th percentile for income, the 80th for health and the 45th for housing quality would amount to (10, 80, 45), with the maximum position being 80. The maximum position plays a key role in the measurement of cumulative deprivation. Individuals with a low maximum position occupy a low position on all dimensions, thus suffering from cumulative deprivation. Indeed, if an individual's maximum position is low, the other dimensions are necessarily even lower. This insight offers a simple method of charting cumulative deprivation by examining the distribution of the maximum positions of all individuals.

The cumulative distribution function of the maximum positions in Belgium is depicted in Figure 3. This is the cumulative deprivation curve.[8] In the figure, for each percentile rank p between 0 and 100 on the horizontal axis, the solid black line indicates the share of Belgian society occupying a lower maximum position than the p in question. For example, as can be seen in Figure 3, 7.22% of all Belgians fall into the lowest third of the three dimensions of well-being (see also Capéau et al. 2018, Chapter 20). Approximately 15% of the Belgian society occupy a maximum position of 50 or lower (i.e. they are represented on the left side of Figure 3). These individuals belong to the lower half of the income distribution, the health distribution and the distribution of housing quality.

Even though disposable income is one of the three dimensions that we consider, not all of the individuals suffering from cumulative deprivation are necessarily poor according to the standard at-risk-of-poverty indicator. Approximately 15% of the individuals in the MEQIN data are income-poor, as measured by the at-risk-of-poverty indicator. To illustrate the difference between the two benchmarks, we examine the overlap between the group having a maximum position lower than 50 and the group of income-poor individuals. Both groups account for approximately 15% of all Belgians. It is important to note, however, that only 6% of all individuals with a maximum position lower than 50 are also income-poor. More than half are therefore positioned above the poverty threshold for the income dimension. The benchmarks for cumulative deprivation and income poverty thus provide different information. The following section provides further details on the profiles of the individuals suffering from cumulative deprivation. The shape of the cumulative deprivation curve in Figure 3 provides information about the manner in which the dimensions of well-being are associated within a society. This can be further clarified by two examples (albeit extreme). For example, consider a society with a maximum dependence between the positions in the various dimensions of well-being. In that case, individuals with a favourable position on one specific dimension would also occupy a favourable position on the other dimensions (the rich are healthy and live in high-quality housing). A feudal society and a traditional caste society are examples of a society with an extremely high dependence between the dimensions. If the dependence is at the maximum, we would need to know only the position of a given individual on one dimension in order to know that individual's entire position vector (given that

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[8] Decancq (2020) refers to this curve as the 'Downward Diagonal Dependence curve'. In theoretical statistics, the curve is known as the diagonal section of the copula function (see e.g. Nelsen, 2006).

the positions are the same on all dimensions of well-being). For each value p on the horizontal axis, exactly p per cent of all Belgians have a maximum position lower than p. In this case, the cumulative deprivation curve equals the 45° line (indicated in Figure 3 by the straight grey curve identified as 'maximum dependence').

For the second example, we assume that there is no systematic dependence between the dimensions of well-being. The political philosopher Michael Walzer (1981) describes such a society as an example of a 'complex egalitarian' society, in which there are impenetrable barriers between the dimensions of well-being. Even in a society in which there is no systematic dependence between the dimensions of well-being, there is a statistical likelihood of suffering from cumulative deprivation (the more dimensions that are regarded at the same time, the less likely it will be to occupy a low position on all dimensions at the same time and, as a result, the fewer people will suffer from cumulative deprivation in a random society). In this case, the cumulative deprivation curve would appear as represented in Figure 3 by the arched grey curve in Figure 3, identified in the legend as 'independence'.[9]

Figure 3. The cumulative deprivation curve for Belgium (Data: MEQIN)
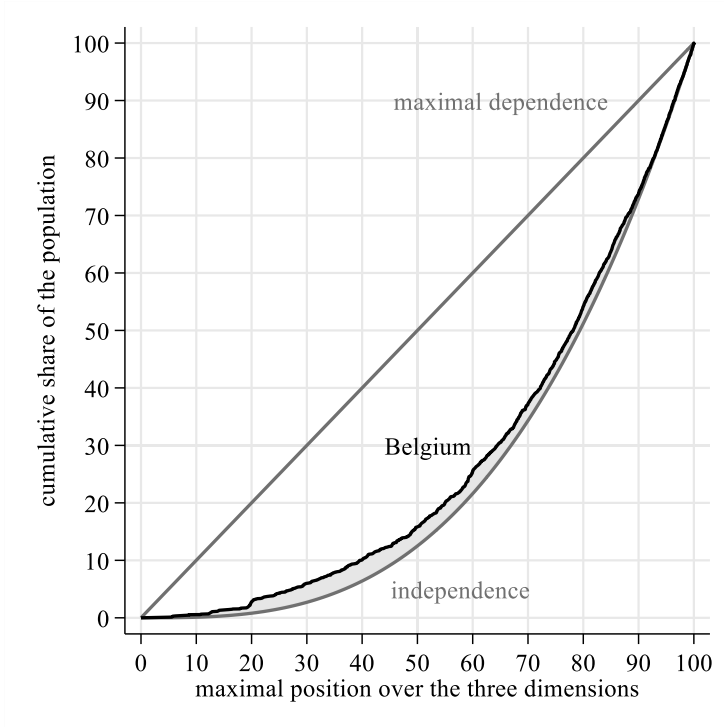
As shown in the figure, the cumulative deprivation curve for Belgium (represented in black) is closer to the curve of independence than it is to the straight curve of the maximum associations. Not all of the individuals represented in the lower part of the income distribution live in poor housing, and not all of them are in poor health. When considering the maximum position 33 on the horizontal axis, however, there are about twice as many Belgians whose maximum position is only 33, as compared to a situation without systematic dependence (7.22% versus 3.7%, to be exact).

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[9] For a negative dependence between the dimensions, the cumulative deprivation curve would lie below the arched grey curve identified in the legend as 'independence'. In the literature on 'fair allocations', a perfect negative dependence is defended as ideal according to the 'no dominance' equity criterion (see also Decancq, 2014).

Decancq (2020) discusses how an intuitive index of cumulative deprivation can be constructed in order to measure the area between the cumulative deprivation curve (represented in black) and the arched curve that represents independence. This area is shaded in light grey in Figure 3. This index provides a multidimensional generalization of a measure of association that was proposed as early as 1904 by the psychologist Charles Spearman (1904). The index for Belgium in 2016 amounts to approximately 0.116, with a slightly lower value for Flanders (0.111) than for Wallonia and Brussels (0.122). Further research is needed in order to determine how this index relates to those in other countries and whether it increases or decreases over time.

4 Who suffers from cumulative deprivation?

In this section, we examine the socio-demographic profiles of the individuals who suffer from cumulative deprivation. We do this based on a descriptive multivariate regression model in which the maximum position of each individual is taken as an explained variable. As explanatory variables, we take a number of observable socio-demographic variables, including sex, migration status, age, relationship status, education, employment and region. We assume a normal distribution for the error term. This error term comprises all idiosyncratic and unobservable factors that contribute to determining the maximum position.

The estimated coefficients of this model are presented in the first column of Table 2. The separate coefficients for each of the socio-demographic variables included (except migration status) are not equal to 0, with a significance level less than 1%. In Columns 2, 3 and 4 of Table 2, this model is compared to three similar models, each focusing on the position in one of the life dimensions.

As indicated by these results, the maximum position of individuals with a low level of education is, on average, approximately 12 percentage points lower than that of those who do not have a low level of education, after controlling for the effects of the other explanatory variables (a low level of education means that the individual has not completed at least secondary education). In addition, the maximum position of unemployed people is more than 10.5 percentage points lower than that of those who are not unemployed. Given that the first column concerns the maximum position across the three dimensions, this finding implies that the effect of a low level of education or unemployment is not limited to the monetary domain, but that it also has an impact on the other two dimensions of life.

Several other remarkable findings are also displayed in the first column of Table 2. On average, the maximum position of women is 5.5 percentage points lower than that of men. In addition, people who are not in a relationship have a maximum position that is 6.2 percentage points lower than that of individuals reporting that they are in a relationship. The maximum position of people in Flanders is an average of 6.3 percentage points higher than that of people in Wallonia and Brussels. According to the results displayed in Table 2, age also has a slight effect on maximum position. Each year of age decreases the maximum position by slightly more than 0.12 percentage points. The maximum position of Belgians of migration status (first generation) is 4.2 percentage points lower, but this effect is only statistically different from 0 at the 10% significance level. Taken together, these results indicate that a Walloon woman who has no relationship, no employment and no completed secondary education is in a particularly precarious condition. On average, her maximum position is 40 percentage points lower than that of an employed Flemish man who is in a relationship and who has completed at least

secondary education.

Table 2. Descriptive multivariate regression analysis

	Maximum Position	Income Position	Health Position	Housing Position
Female (ref: male)	-5.500***	-6.592***	-5.082***	-2.005
	(1.526)	(1.375)	(1.511)	(1.499)
Migrant (ref: non-migrant)	-4.152*	-8.829***	1.392	-9.268***
	(2.471)	(2.226)	(2.447)	(2.427)
Age (in years)	-0.127***	-0.030	-0.473***	0.258***
	(0.048)	(0.043)	(0.047)	(0.047)
Not in a relationship (ref: In a relationship)	-6.221***	-11.405***	-3.964**	-2.523
	(1.597)	(1.438)	(1.581)	(1.568)
Low education (ref: Not low education)	-11.950***	-15.370***	-7.460***	-6.045***
	(1.683)	(1.516)	(1.667)	(1.653)
Unemployed (ref: Not unemployed)	-10.512***	-29.237***	-7.331**	-5.103
	(3.457)	(3.114)	(3.423)	(3.396)
Flemish (ref: Brussels or Walloon)	6.304***	0.779	0.862	14.055***
	(1.536)	(1.384)	(1.521)	(1.509)
Constant	61.791***	65.131***	79.733***	33.411***
	(2.945)	(2.653)	(2.916)	(2.893)
N	1,400	1,400	1,400	1,400
R^2	0.114	0.233	0.133	0.114

Standard errors in parentheses (*$p<0.10$; **$p<0.05$; ***$p<0.01$)

The results presented in Table 2 (Columns 2, 3 and 4) also make it possible to compare the socio-demographic profile of individuals with a low maximum position to that of individuals with low positions for the separate dimensions. Comparing the columns to each other reveals that the profile of individuals with a low position differs from one dimension to another. On average, and after controlling for the other explanatory variables, women occupy a lower position in the distribution of income and health, but not in the distribution of housing quality. Although there is no significant difference in the position of Belgians with a background of migration background on the health dimension, there is a clear difference (nearly 10 percentage points) on the dimensions of income and housing quality. Age has a negative effect on an individual's position on the health dimension, while it has a positive effect on housing quality. Single Belgians who are not in a relationship have a lower position on both the income dimension and the health dimension. Although the effects of education and, especially, employment are particularly tangible in terms of income, the results once again reveal that these factors have a significant effect on health. Finally, the regional effect is manifested largely in housing quality, with people in Flanders occupying positions that are clearly higher than those of people in Wallonia and Brussels.

5 How can deprivation accumulate?

Finally, we examine in greater detail the question of how deprivation can accumulate across the various dimensions. In reality, a tangled web of interactions exists between the dimensions and the characteristics of individuals. The associations between a few observable socio-demographic characteristics and position along the three dimensions are addressed in Columns 2, 3, and 4 of Table 2. Without longitudinal data, it is virtually impossible to unravel this web in order to identify causal relationships. The discussion in this section is therefore limited to describing a few channels along which the various dimensions can influence each other. In essence, these channels poke holes in the impenetrable barriers between the dimensions of life included in Walzer's (1981) ideal image of a 'complex egalitarian' society. In this regard, we focus on those channels for which information is available in the MEQIN dataset.

Figure 4 presents a description of several channels along which the various dimensions can influence each other. Each of the six panels in the figure is constructed in the same way. For each decile of the maximum position, the average value of one variable is presented. People suffering from cumulative deprivation appear on the left side of each panel.

The first panel presents the percentage of individuals reporting that they had delayed medical care from a general practitioner or specialist due to financial reasons. Approximately 8% of the Belgians in the sample indicated that they had been forced to delay medical care. This percentage is much higher, however, for the group of people suffering from cumulative deprivation. For example, 24.4% of those in the first decile for maximum position had to delay healthcare. Along this channel, a low position on the income dimension can extend to the health dimension. Conversely, a low position on the health dimension can have a major impact on the household budget remaining available for expenditures.

The second panel shows the number of people reporting having hospitalisation insurance. Slightly more than three fourths of the respondents in the MEQIN dataset indicated having hospitalisation insurance. In this case as well, there is a clear gradient with cumulative deprivation. Fewer than 60% of those in the first decile for maximum position had hospitalisation insurance.

The third panel concerns the 690 individuals in the sample who were employed. Nearly 90% of the employed respondents in the first decile responded that they 'somewhat agree', 'agree' or 'completely agree' with the statement that they worked under hazardous or unsafe conditions. This percentage declines sharply in the higher deciles of maximum position. This is a channel along which achieving a higher position on the income dimension can be associated with being less likely to occupy a low position on the health dimension.

As shown in the fourth panel, people suffering from cumulative deprivation were much more likely to report poor health or invalidity as a reason for not being able to work. Whereas nearly 30% of the respondents in the first decile for the maximum position gave this response, as compared to virtually none of those in the upper half of the distribution. In this way, poor health can lead to a lower income position.

The two lower panels show the associations between housing quality and the other two dimensions. As indicated in the fifth panel, approximately 40% of the respondents in the first decile reported having

struggled with difficulty meeting their rent or mortgage payments in the past year. This figure was much lower in the higher deciles of the distribution of maximum position.

Housing quality can also have an impact on position in the health distribution. Nearly one third of the respondents in the first decile were more likely to report that they 'somewhat agree', 'agree' or 'completely agree' with the statement that their homes had dampness or mould on a wall or floor. This percentage once again declines sharply in the higher deciles of the distribution of maximum position.

The interaction of these (and many other) channels that connect the various dimensions of life with each other can lead to a vicious circle that pushes people lower and lower in the various life dimensions. A low position in one dimension can lead to or exacerbate a low position in other dimensions. For example, an unexpected negative income shock could lead to difficulty paying for housing, possibly resulting in relocation to lower-quality housing. This could subsequently lead to health problems, with a further negative impact on income position, causing medical care to be delayed and so forth. For people who are trapped in such a vicious circle, bad news does not come alone.

Figure 4. Illustrations of channels along which deprivation can accumulate
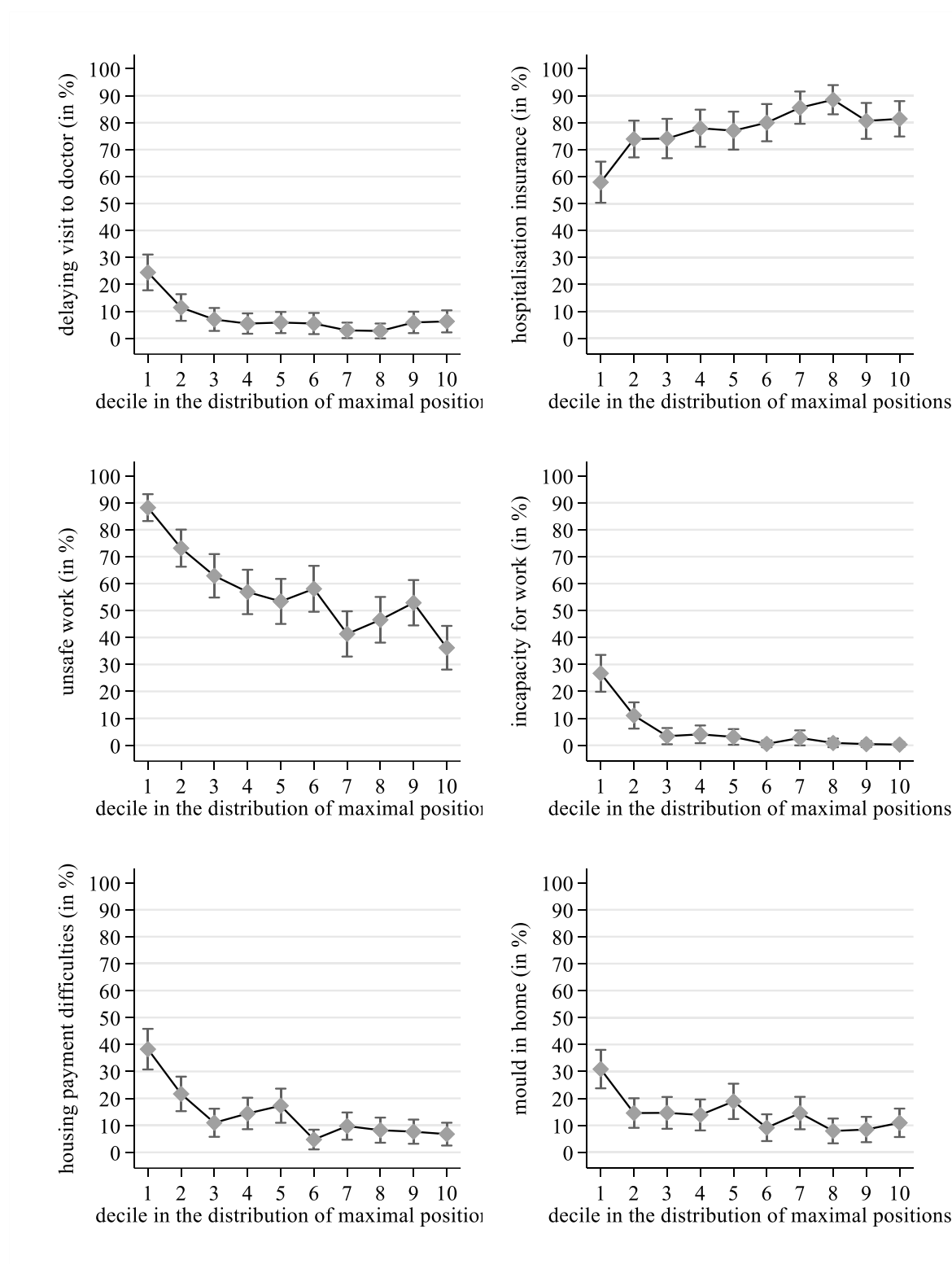
6 Conclusion

We say that people suffer from cumulative deprivation if they occupy a low position on several dimensions of life at the same time (e.g. income, health and housing quality). This article presents an initial analysis of the phenomenon of cumulative deprivation in Belgium. To this end, we used the array of instruments recently proposed by Decancq (2020), based on the MEQIN dataset for 2016. Although there are specialised datasets that chart the relevant dimensions in detail for Belgium, an analysis of cumulative deprivation requires a broad dataset that contains information on all relevant dimensions for the same respondents. At this time, the MEQIN dataset is one of the few datasets that can be used for such a broad, multidimensional analysis of well-being for a random sample of Belgians.

Based on the cumulative deprivation curve, our results indicate that the life dimensions considered here exhibit a troubling dependence, particularly in the lower regions of the distribution. Our findings reveal that twice as many people fall into the lowest third of the three dimensions under consideration, as compared to what could be expected in a 'complex egalitarian' society, in which there is no systematic dependence between the dimensions. Furthermore, as revealed by the descriptive multivariate regression analysis, Walloon women who have no relationship, no employment and no completed secondary education are particularly likely to be in the precarious condition of cumulative deprivation. Finally, we examined in greater detail several channels along which deprivation can accumulate across the various dimensions. According to our findings, people suffering from cumulative deprivation are more likely to experience difficulty paying for medical care and housing, to be employed in unsafe jobs and to have poor housing. This is likely to create a vicious circle, in which a low position in one dimension can extend to other dimensions, thereby leading to cumulative deprivation.

By definition, these and other insights can never be obtained by examining only one dimension of life in isolation from the others (as is common with the use of a dashboard of policy indicators). At this point, I would like to advocate the collection of longitudinal, multidimensional data and the adoption of an 'inter-dimensional' view of policy relating to poverty and well-being. Although an exclusive focus on a single dimension is useful, it should be supplemented by an analysis of the dependence between the dimensions. Only in this way can we detect the vicious circle of cumulative deprivation early and break through it.

References

Alkire, S. and Foster, J. (2011). Counting and multidimensional poverty measurement, *Journal of Public Economics* (95:7-8), pp. 476-487.

Atkinson, A. B., Cantillon, B., Marlier, E. and Nolan, B. (2002). *Social Indicators: The EU and Social Exclusion*, Oxford University Press, Oxford.

Capéau, B., Cherchye, L., Decancq, K., Decoster, A., Rock, B. D., Maniquet, F., Nys, A., Périlleux, G., Ramaekers, E., Rongé, Z., Schokkaert, E. and Vermeulen, F. (2018). *Wat heet dan gelukkig zijn? Geluk, welvaart en welzijn van de Belgen*, Garant.

Decancq, K. (2014). Copula-based measurement of dependence between dimensions of well-being, *Oxford Economic Papers* (66:3), pp. 681-701.

Decancq, K. (2020). Measuring cumulative deprivation and affluence based on the diagonal dependence diagram, *Metron* (78:2), pp. 103‑11.

Decancq, K. and Lugo, M. A. (2013). Weights in multidimensional indices of well-being: An overview, *Econometric Reviews* (32:1), pp. 7-34.

Decancq, K., Nys, A. and Rongé, Z. (2020). Growing up in a poor household in Belgium: a multidimensional perspective, *Mimeo*.

Decancq, K. and Schokkaert, E. (2016). Beyond GDP: Using equivalent incomes to measure well-being in Europe, *Social Indicators Research* (126:1), pp. 21-55.

Miller, D. (1995). Complex equality, in Miller, D. and Walzer, M. (eds.), *Pluralism, Justice and Equality*, Oxford University Press, Oxford, pp. 197-225.

Nelsen, R. B. (2006). *Introduction to Copulas*. Springer Verlag, New York.

Nussbaum, M. (2000). *Women and Human Development: the Capabilities Approach.* Cambridge: Cambridge University Press.

Sen, A. K. (1985). *Commodities and Capabilities*, North-Holland, Amsterdam and Oxford.

Sen, A. K. (2009). *The Idea of Justice*, Allen-Lane.

Spearman, C. (2010). Reprinted: The proof and measurement of association between two things, *International Journal of Epidemiology* (39:5), pp. 1137-1150.

Walzer, M. (1983). *Spheres of Justice*: A Defense of Pluralism and Equality, Basic Books, New York.