

World
Psoriasis
Happiness
Report 2018.



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Foreword

The case for Health-related Happiness Research

Everybody wants a satisfying life for themselves and their children. Individually, people seek ways to achieve a more satisfying life and this quest is manifested in the soaring sales of ‘how-to-be-happy’ books and in the ongoing development of life-coaching businesses. Collectively, people call on governments to improve the necessary social conditions for happiness; for example, 85% of the British people agree with the statement that ‘A government’s prime aim should be achieving the greatest happiness of the people, not the greatest wealth’ (BBC 2006, question 14).

This call for greater happiness is not new, it has featured in Western world thought since antiquity, becoming particularly salient during the 18th century European Enlightenment. During this time, philosopher and social reformer, Jeremy Bentham, declared that we should aim for ‘greater happiness for a greater number’ (Bentham 1789). This call for greater happiness grows in strength, because, among other things, research has shown that it is possible (Veenhoven 2015).

Applied to healthcare, this call for greater happiness means that healthcare should move beyond objective health status, and in addition consider the wider well-being of patients. This view is reflected in the WHO definition of health as ‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’. Accordingly, a strand of research on ‘Health Related Quality of Life’ has developed, commonly abbreviated as ‘HQOL’. The focus is on patient-reported outcomes and the aim is to improve treatments and set priorities using the information it

generates. A main scientific journal on this field is ‘Quality of Life Research’.

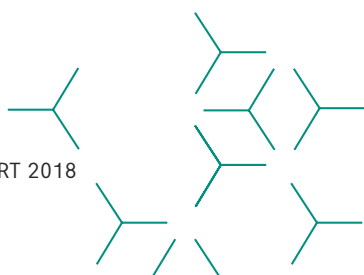
Though the aim of HQOL research is to measure ‘quality of life’, most questionnaires actually assess ‘health’, e.g. the widely used SF-36 is a ‘Short Form’ taken from a longer ‘Health questionnaire’. Most items in such questionnaires are about symptoms of illness and how they restrict behaviour. If included at all, questions on subjective well-being typically focus on aspects of life such as satisfaction with social interactions, but seldom address life as a whole. As such, current HQOL research does not inform us about the effects of illness and healthcare on happiness. What we need is Health-related Happiness (HH) research, in which the loosely defined ‘QOL’ is substituted with a ‘H’ for happiness, where happiness is defined as life satisfaction. Health-related Happiness research is still developing and its results are gathered in the World Database of Happiness, which currently covers some 300 studies of this kind. Much of this research concerns the relationship between

happiness and general health, rather than specific health problems and is typically confined to a region or nation. This second World Psoriasis Happiness Report marks a step forward in this field, as it considers the effect on happiness of one particular illness, psoriasis, in great detail, and covers 21 nations. Though not exclusively focusing on happiness in the sense of life-satisfaction, the report adds considerably to the HH knowledge base.

This Report not only adds to our scientific understanding of the impact of this illness, but will hopefully also enlighten health policy makers, in particular, with respect to the substantial loss of happiness for psoriasis patients and the social costs involved when living with this illness.

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<https://personal.eur.nl/veenhoven>



**References:**

BBC (2006) The happiness formula: Opinion poll GfK-NOP poll 421059. Report available at: http://news.bbc.co.uk/nol/shared/bsp/hi/pdfs/29_03_06_happiness_gfcpoll.pdf

Bentham, J. (1789) An Introduction to the Principles of Morals and Legislation, London
Available at: <http://socserv2.socsci.mcmaster.ca/econ/ugcm/3ll3/bentham/morals.pdf>

Quality of Life Research, An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation
Available at: <https://link.springer.com/journal/11136>

Veenhoven (2015) Happiness: History of the concept. in: James Wright (Ed.) International Encyclopaedia of Social and Behavioural Sciences, 2nd edition Vol. 10 pp 521-525, Oxford Elsevier

World Database of Happiness: Archive of research findings on subjective enjoyment of life. Erasmus University Rotterdam, Netherlands.
- Publications on happiness and physical health available at: https://worlddatabaseofhappiness.eur.nl/hap_bib/dis_class.php#69
- Abstracts of research findings on happiness and physical health available at: https://worlddatabaseofhappiness.eur.nl/hap_cor/desc_topic.php?tid=3938



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Executive Summary



The World Psoriasis Happiness Report 2018 continues to explore the impact that living with self-reported psoriasis has on subjective happiness¹. The report aims to facilitate the development and exchange of ideas and policy initiatives to improve the lives of more than 125 million people living with psoriasis around the world².



¹ The target population of PsoHappy is people living with self-reported psoriasis, meaning that the respondents do not necessarily have the diagnosis confirmed by a dermatologist. For this reason, the findings of this report can't be cited or referred to as if they were based on a clinical diagnosis confirmed by healthcare specialists.

² <https://ifpa-psy.com/about/> Accessed 28 August 2018.



This report analyses input we have received on surveys delivered through psohappy.org, which explores different aspects of living with self-reported psoriasis, from 79,636 users in 21 countries.

The World Psoriasis Happiness Report 2017 showed that psoriasis affects happiness, with happiness gaps being as high as -30% among people living with self-reported severe psoriasis. It also showed that women are significantly more affected than men, and that stress and loneliness are key predictors of happiness for people with self-reported psoriasis.

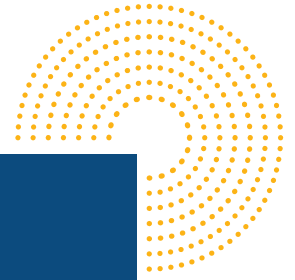
The report also indicated that how respondents perceive their relationship with healthcare professionals is linked not just to their illness, but also to their happiness. In fact, this was established to be an important factor that might affect the happiness of people we studied. This year's report further explores these topics and aims to go deeper into the key factors that 'make happiness' for people with self-reported psoriasis.

Ten key insights in this report:

1. Psoriasis undermines people's happiness

As seen in the World Psoriasis Happiness Report 2017, living with self-reported psoriasis often has a negative effect on people's lives, but the impact varies a lot between country populations. While Mexicans and Colombians often thrive, misery is very common in countries such as Australia, the UK and China.

- Australia, Czech Rep, the UK and China stand out at the bottom of the happiness ranking. More than 51% of people with self-reported psoriasis in China live in misery (reported happiness levels between 0-4), while in the UK the percentage is 36%. As a comparison, only 16-19% of Mexicans and Colombians report to live in misery.
- The country averages for people living with self-reported psoriasis differ from the general population scores of the respective countries. This is what we define as 'happiness gaps' - which also vary greatly. For instance, for people living with self-perceived severe psoriasis we find a happiness gap of -37.8% in UK and a -5.7% in Greece. Currently, we have developed 4 possible explanations for the country variations in happiness gaps:
 - a) Collectivistic versus individualistic cultures;
 - b) Social comparison of utility;
 - c) Prevalence of depression;
 - d) The population's perception of how well healthcare professionals understand the impact psoriasis has on mental well-being.



2. Psoriasis puts a cost on society

People living with self-reported psoriasis are subject to lost productivity at work, which is directly linked to monetary costs for society.

- In the US, the cost of self-reported psoriasis is estimated at \$30bn (per year). This amounts to \$19m per 100,000 people employed or 0.16% of GDP.
- In the UK, the cost is \$2bn, which is \$8m per 100,000 people employed or 0.09% of GDP.
- The highest by far is France, with an estimated cost of \$78m per 100,000 people employed.

3. Investing in happiness for people living with psoriasis can help millions of lives and save societies billions of dollars

Reporting to be impacted by depression or anxiety is a strong predictor of lost productivity, which in turn puts a cost on society. Investing resources in happiness for people living with psoriasis holds the potential to greatly improve general well-being for individuals and maximise economic output for societies.

4. Unemployment is detrimental to happiness - especially when it's permanent

People employed for wages are significantly happier than people out of work. People who are unable to work are subject to misery more often than any other group. This holds true for people living with self-reported psoriasis and people in general. Self-employed and retired people are, however, more happy than people employed for wages.

The group of people who are unable to work become a case of ethical concerns. On one hand they are presented as a 'priority group' as they are more often subject to misery than any other group surveyed, but on the other hand they are likely to be seen as a cost for society when assessing value in monetary terms.

5. People living with psoriasis are likely to benefit from inclusive work environments

Of the four factors we tested when assessing the impact of relationships and systems at work on the happiness levels of people with self-reported psoriasis, only one has a significant influence: *'My work colleagues know about my psoriasis and I get their support when needed'*. An understanding manager or a very close co-worker, interestingly, are without any effect. An interpretation of this could be that the happiness of people living with psoriasis is more dependent on having acknowledging and inclusive social environments than one-on-one relationships that attempt to provide the same. The frequency of people who agree that they have work colleagues that know about their psoriasis varies a lot by country, from 14.1% in Germany to 28% in Greece.

6. People living with psoriasis often report suffering from a mental illness

Of all comorbidities surveyed, the presence of depression or other mental disorders, as well as back pain, is the greatest cause of unhappiness. Happiness gaps are significantly larger in countries where depression is highly frequent (such as the US, UK and Australia) than in countries where depression is less frequent (such as Russia, Portugal and Italy).

7. People with bad lifestyle habits are unhappier but report fewer comorbidities

Bad lifestyle habits (smoking, drinking, eating unhealthily and never exercising) are associated with unhappiness. There is, however, an inversely proportional relationship between bad lifestyle habits and the number of comorbidities, suggesting people alter their lifestyle to mitigate those comorbidities. People who never drink are subject to higher happiness gaps and more comorbidities than people who drink up to 10-19 drinks per week. This effect may be explained by the social isolation often experienced by those who never drink, but this only applies to women.

8. Good sleep is a strong predictor of happiness

The happiness levels of people living with self-perceived psoriasis who report to have 'very good sleep' do not differ much from the happiness levels of the general population. As sleep quality decreases, so do happiness levels. Comorbidities are inversely correlated with sleep quality.

9. Loneliness is a risk factor for people living with psoriasis

The frequency of stress and loneliness among people living with self-reported psoriasis calls for greater emphasis on mental and social well-being when assessing their general health and happiness. Even though bad lifestyle habits and some comorbidities (depression and other mental disorders, back pain and liver diseases) are associated with unhappiness, social and mental conditions that disrupt the ability to function normally in daily life - such as loneliness and stress - are stronger predictors of general well-being.

The World Health Organization states that preventable risk factors underlie most noncommunicable diseases³. By preventable risk factor they refer to tobacco use, physical inactivity, unhealthy diets and harmful use of alcohol (the four 'bad habits' we have also applied in this study). However, this study finds that comorbidities are more correlated with social isolation than lifestyle factors when controlling for all relevant factors.

10. Don't mistake patient satisfaction for happiness

A person's satisfaction with their healthcare provider is not an indicator of their general happiness; the two are not strongly correlated. If healthcare professionals want to address psoriasis-related happiness and well-being, they should move their attention beyond factors that solely promote satisfaction towards actions that are linked to happiness, such as direct conversations about mental health.



³ Accessed 20th July 2018 at: http://www.who.int/gho/ncd/risk_factors/en/

Introduction:

A case for happiness measures in psoriasis management

Over the past fifty years, general welfare has tended to be measured in terms of Gross Domestic Product (GDP)⁴. Despite this, the deficiencies of GDP as an indicator of welfare and general well-being are well reported, and the limitations are broadly accepted by economists⁵.

Within the last decade this has provoked a paradigm shift in how we evaluate social progress and has seen subjective well-being (i.e. happiness) emerge as a key metric in welfare economics. Today, subjective well-being measures are adopted and employed by several key agents including the United Nations, the OECD and the UK government. It has also been integrated as a core measure in acknowledged household surveys such as Eurobarometer⁶, The General Social Survey⁷, European Social Survey⁸, Gallup World Poll (applied in The World Happiness Report)⁹, the Office of National Statistics in the UK¹⁰ and Statistics Denmark¹¹.

Health is more than just the absence of physical hardship. The WHO emphasizes that health is a state of complete physical, mental, and social well-being and not merely the

absence of disease or infirmity. We therefore need to recognise the risk that our current health assessments may fail to sufficiently reflect how people experience their lives, and therefore how healthy they truly are. This is something that has been recognised by leading organisations across the globe, including Harvard University, which established the Center for Health and Happiness in 2016.

One way to integrate the well-being dimension in health assessment is through conventional models, including 'quality of life' scales such as the QALY (Quality-Adjusted Life Years)¹². These assessment tools are familiar and have a long history of practical application, but this fact should not disguise the blind spots they become subject to and the important issues that they do not take into account, such as 'focusing effects'¹³.

⁴ Stiglitz, J. E., Sen, A. & Fitoussi, J. P. (2009) *Report by the Commission on the Measurement of Economic Performance and Social Progress*, Paris.

⁵ GDP has been criticized by many famous economists such as Nobel Prize winners Kenneth Arrow, Simon Kuznets, Daniel Kahneman, Robert Solow, Joseph Stiglitz, Amartya Sen and Muhammad Yunus. Source: Wesselink, B., Bakkes, J., Best, A., Hinterberger, F., ten Brink, P. (2007), *Measurement Beyond GDP*, paper presented at Beyond GDP: Measuring progress, true wealth, and the well-being of nations, November 2007, Brussels.

⁶ Accessed 26th august 2018 at: <https://ec.europa.eu/eurostat/>

⁷ Accessed 26th august 2018 at: <https://gssdataexplorer.norc.org>

⁸ Accessed 26th august 2018 at: <http://www.europeansocialsurvey.org/>

⁹ Helliwell, J., Layard, R. & Sachs, J. (2018). *World Happiness Report 2018*, New York: Sustainable Development Solutions Network.

¹⁰ Accessed 26th august 2018 at: <https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing>

¹¹ Accessed 26th august 2018 at: <https://www.dst.dk/extranet/livskvalitet/livskvalitet.html>

¹² QALY is calculated through different descriptive systems such as the EQ-5D, the SF-6D and SF-36, and is used as a reference case by agents such as NICE (National Institute for Health and Care Excellence).

¹³ Dolan, P. & Kahneman, D. (2008) *Interpretations of utility and their implications for the valuation of health*. *Economic Journal*. 118(525), 215-234

People tend to overestimate the severity of many health conditions when they are asked to consider them specifically. Such ‘focusing effects’ present a major concern when assessing the relationship between health and subjective well-being, as the extent to which patients assess their state of health is exaggerated¹⁴.

Because of this phenomenon, subjective well-being metrics are helpful as they allow us to study what is important in people’s lives and what factors impact mental and social well-being without requiring respondents to simultaneously weigh up different factors¹⁵.

As subjective well-being assessments (i.e. happiness measures) are not specifically disease nor health related, they are sensitive to a much wider range of important things than a conventional model¹⁶. This sensitivity also makes them more universally applicable, meaning that they can be applied to several patient groups, as well as general

populations. This provides us with new possibilities to understand health driven happiness inequality.

We are facing a global mental health epidemic which calls for more holistic health assessment tools. As the World Psoriasis Happiness Report 2017 emphasised, though psoriasis is a physical disease, for those living with it, it is most of all a social and mental issue that is strongly linked to stress, low self-esteem and loneliness¹⁷.

These insights raise the concern that conventional models may underreport and undervalue the importance of mental health and social well-being.

Subjective well-being measures, though less familiar or established, can provide a more holistic and patient-centric method of capturing a sense of general well-being. Subjective well-being metrics thereby report what health-related quality of life measures ought to capture, but have a much wider applicability to things that people care about.



¹⁴ Dolan, P. & Kahneman, D. (2008) *Interpretations of utility and their implications for the valuation of health*. Economic Journal. 118(525), p215-234.

¹⁵ Dolan, P. (2011) *Using Happiness to Value Health*, Office for Health Economics, London

¹⁶ Ibid.

¹⁷ Leo Innovation Lab & Happiness Research Institute (2017) *World Psoriasis Happiness Report 2017*, Copenhagen, Denmark



Methodology

How do we define happiness?

To help us develop a comprehensive understanding of the happiness levels of people living with self-reported psoriasis, we have measured factors for which there is the most evidence for validity, where results are least complicated to interpret, and where policy relevance is the most developed.

Happiness:

Research has revealed that happiness as a concept is pluralistic. It includes a continuum from **life evaluation**, which involves a cognitive evaluation of the respondent's life as a whole, to **affect**, which captures the emotions and experiences of the respondent. This report weighs the former dimension, as it is the dimension which is the most frequently-used and reliable dimension in happiness research, and the dimension that produces the most research results¹⁸. Thus, whenever 'happiness' is used throughout the report it refers to how people evaluate

their life as a whole, rather than their daily emotions and experiences.

Life evaluation:

When measuring **life evaluation**, we adopt the scale used by the United Nations, the Gallup World Poll and Columbia University in the **World Happiness Report**.

We used the Cantril Self-Anchoring Striving Scale (also referred to as the Cantril Ladder¹⁹). The Cantril Ladder is possibly the most acknowledged measure of happiness today, and has been applied in a vast number of research studies around the world. When the United Nations employ the scale in the **World Happiness Report**, it is based on data collected by the Gallup World Poll which includes insights about more than 150 countries, representing 98% of the world's population.

The Cantril Ladder was developed by the social researcher Dr. Hadley Cantril and is evaluated based on of the following question:

'Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you.

- *On which step of the ladder would you say you personally feel you stand at this time?*
- *On which step do you think you will stand about five years from now?'*

Drivers of happiness:

Happiness and unhappiness manifest in multiple aspects of our lives. We are interested in understanding how psoriasis is related to social well-being, mental well-being and physical well-being.

Adopted measures:

- **Loneliness:** To assess loneliness, we use the UCLA Loneliness Scale²⁰, which is often considered the 'gold standard'. We use a revised version designed for studies with larger sample sizes, which consists of three questions related to social isolation and loneliness.





• **Stress:** To measure stress, we employ the Perceived Stress Scale developed by Dr. Sheldon Cohen²¹. This scale consists of 10 questions related to how the respondent experiences life events that are often beyond their control. The scale gives us an indication of the general resilience of the respondent, and doesn't ask questions related to more specific areas such as work life and private life.

The Perceived Stress Scale is not suitable to give an actual stress diagnosis of the individual, but is often used to evaluate and address stress levels in sub-groups of the population.

Original measures:

In addition to the adopted measures, we also apply original measures related to the disease or quality of life of the individual including: self-reported psoriasis severity, productivity at work, assessment of the healthcare system and healthcare professionals, lifestyle behaviour and experienced comorbidities (such as depression or joint diseases). Finally, we ask open-ended questions where the respondents can freely express their feelings about living with psoriasis.

How we measure happiness

PsoHappy is an ongoing survey platform for gathering insights around different aspects of happiness and well-being for people living with self-reported psoriasis.

The study is delivered through the PsoHappy web app, available for free at <https://psohappy.org/survey>. Anybody living with psoriasis, regardless of their treatment or severity, can access the app and answer the short surveys.

At the time of writing this report (August 2018), the surveys are delivered in 13 languages: English, Spanish, Portuguese, French, German, Italian, Russian, Chinese, Danish, Norwegian, Japanese, Czech and Greek.

The surveys were served in sets of 4-5 sets of questions, which were available for 3-4 months.

The sets of questions were sent out in a random order to ensure a sufficient sample size for each survey.

The application allowed participants to drop off and come back later to answer the next set of questions of the survey.

In order to ensure participants were genuinely 'real people living with psoriasis', several qualifying questions relating to different aspects of living with psoriasis were asked during the first survey. We also included the option 'I don't have psoriasis' in the list of possible answers.

¹⁸ OECD (2013) *Guidelines On Measuring Subjective Well-being*, Paris: OECD Publishing.

¹⁹ Cantril, H. (1965). *The pattern of human concerns*. New Brunswick, NJ: Rutgers University Press.

²⁰ Russell, D. W. (1996). *UCLA Loneliness Scale (version 3): Reliability, validity and factor structure*. *Journal of Personality Assessment*, 66, 20-40.

²¹ Cohen, S., Kamarck, T., & Mermelstein, R. (1983). *A global measure of perceived stress*. *Journal of Health and Social Behavior*, 24, 385-396.

Who we measure

Target population

The target population of PsoHappy is people living with self-reported psoriasis, meaning that the respondents do not necessarily have the diagnosis confirmed by a dermatologist. For this reason, the findings of this report can't be cited or referred to as if they were based on a clinical diagnosis confirmed by healthcare specialists.

Furthermore, the severity of disease is also measured in subjective terms. This is important to be aware of, as there are potentially significant differences between how the patients perceive their severity and how a healthcare professional would diagnose it. For instance, one study finds that 22% of patients with diagnosed mild psoriasis would report that they have severe psoriasis, and 43% would report they have moderate psoriasis. For those with diagnosed moderate psoriasis, these numbers are 39% reporting severe and 7% reporting mild²². Again, the insights based on severities can't be cited or referred to as if they were based on a clinical diagnosis confirmed by healthcare specialists. However, in a happiness and well-being perspective the subjective severity assessments may prove important as they (at least to some extent) can serve as a proxy for the patient's happiness.

Our objective is to achieve a representative sample of this group in all the countries we

study. We only study people above the age of 15 who are considered residents of the country in question. We chose to capture the resident population rather than citizens of a country because many policy-relevant drivers of happiness depend on where a person lives. This is also necessary to ensure that international comparisons are like for like. This is important as we, for example, compare our subjective well-being scores (i.e. happiness) to the scores presented in the *World Happiness Report*²³.

Data collection

Participants were recruited through:

- Content marketing initiatives, with both curated content and proprietary content created in-house, such as patient stories and reflections on the emotional aspects of living with psoriasis on <https://psohappy.org/blog>
- Social media, such as Twitter, YouTube, LinkedIn, WeChat in China, and Facebook ads campaigns, targeting people who have expressed an interest in psoriasis-related pages in each country
- Google ad campaigns targeting people based on their searches
- E-mail activation campaigns
- Invitations to patient associations for their members to take the surveys from countries where we have partnerships such as Denmark, France, Canada, Australia, Belgium, China and Japan.

²² Lebwohl, M.G., Bachelez, H., Barker, J., Girolomoni, G., Kavanaugh, A., Langley, R.G., Paul, C.F., Puig, L., Reich, K., van de Kerkhof, P.C. (2014) *Patient perspectives in the management of psoriasis: results from the population-based Multinational Assessment of Psoriasis and Psoriatic Arthritis Survey*. *J Am Acad Dermatol*. 2014; 70: 871–881

²³ Helliwell, J., Layard, R. & Sachs, J. (2017). *World Happiness Report 2018*, New York: Sustainable Development Solutions Network.



Geographical coverage and criteria for inclusion

Our full dataset had undergone some sample procedures in order to be eligible for analysis:

- We applied an age filter which excludes all respondents below the age of 15
- We applied a minimum threshold for the country sample-sizes. A country was deemed to be eligible for inclusion and statistical analysis if it had 384 people living with self-reported psoriasis per survey²⁴. By this criteria, 21 countries were considered eligible for inclusion for the overall country happiness ranking (Chapter 1): Australia, Belgium, Brazil, Canada, the Czech Republic, China, Colombia, Denmark, France, Germany, Greece, Ireland, Italy, Japan, Mexico, Norway, Portugal, the Russian Federation, Spain, the United Kingdom and the United States of America.
- In Chapter 2,3 and 4 we also aimed to include countries with a minimum sample size of 384. However, we have at times included countries that didn't meet this criteria, simply to attain a broader picture of the links between psoriasis and happiness. In these cases we make disclaimers, and the observations will never be based on a sample size lower than 96 respondents, which is the criteria for a margin of error of 10% and a 95% confidence interval. Due to the fact that not all of the 21 countries are included in the analysis in Chapters 2, 3 and 4, we have clearly listed the countries included and their respective samples at the beginning of each chapter.
- Finally, we have added population weights to account for population size differences. The population size weight corrects for population size when combining the data for two or more countries.

²⁴ A representative sample requires a size of 384 units (5% margin of error and a 95% confidence level)

Source: Cochran, W. G. 1963. Sampling Techniques, 2nd Ed., New York: John Wiley and Sons, Inc.

$$SS = (Z\text{-score})^2 * p*(1-p) / (\text{margin of error})^2$$

$$SS = (1.96)^2 * 0.5*(1-0.5) / (0.05)^2$$

$$SS = 3.8416 * 0,25 / 0.0025$$

$$SS = 384.16$$

Analysis

Simply developing and employing the research questions is not sufficient to interpret the data output, as surveys may be addressed in more than one valid way.

Therefore, in this study we employ different analytical approaches to produce different perspectives on the data. We use descriptive analysis, but the insights are predominantly based on regression analysis to determine key drivers of happiness for people with self-reported psoriasis.



Limitations of methodology

Frequency and survey design

In PsoHappy we collect data continuously through campaigns of 4-5 sets of questions. This is problematic as we do not get a time-consistent account of the respondents subjective well-being. Our consideration about this design is the trade-off between survey goals and the burden placed upon the respondents, and it is our view that a single survey would cause a smaller and potentially unrepresentative sample size. Also, collecting data over time makes it possible to test for the timing of the collection, which has proven to be of big importance (For example, measures of positive affect are higher on weekends and holidays than on weekdays)²⁵.

Despite these considerations one could still argue that the time-consistency would impose a challenge in terms of reliability. In other words, if we compare aggregate subjective well-being scores collected at different moments, we could assume that these indicators are not comparable due to events taking place in the time between, affecting the overall subjective well-being. However, aggregate measures of subjective well-being generally tend to change only slowly over time: *for example, the experience of unemployment - which is associated with a change in life satisfaction of between 0.7 and 1 on a 0 to 10 scale for the person experiencing it - typically affects between 3% and 10% of the adult population. Thus, even a large shift in*

*the unemployment rate — say, an increase of five percentage points — will translate only into a small change in measures of average subjective well-being through its direct impact on the unemployed*²⁶.

Survey mode and mode effects

PsoHappy data is collected by Self-Administered Questionnaires (SAQs), traditionally conducted in a pen-and-paper format, but which increasingly involve Internet-based surveys. As the SAQs are provided through an app we must consider both coverage errors (where we fail to reach some certain segments) and non-response bias (due to preferences for certain modes among respondents). Furthermore, the survey mode also becomes important to consider when we compare our data to data collected by different modes.

Coverage error

Due to the fact that our surveys are provided through an app, participation levels depend on cultural and economic factors such as having access to a device that can connect to the Internet and, to some extent, being informed and engaged with their psoriasis condition. It is our assumption that issues will occur with samples in countries where large segments of society don't fulfill these cultural and economic conditions.

²⁵ OECD (2013), *OECD Guidelines on Measuring Subjective Well-being*, OECD

²⁶ Helliwell, J., Layard, R. & Sachs, J (2013). *World Happiness Report 2015*. New York: Sustainable Development Solution Network

Furthermore, the Psohappy is translated into 12 languages, making it possible to reach groups within societies where people are not proficient in English. For some countries a language coverage error will of course come into play due to the lack of translations. In those cases our data become subject to issues of representation, assuming that the respondents often represent more culturally privileged groups due to their language proficiencies.

Non-response bias

Another mode effect to consider is non-response bias. Whether a person living with psoriasis can answer a survey on a smartphone or a computer does not only depend on the above mentioned cultural and economic factors, but also on preferences. As a result of this, it is our assumption that older generations who are not frequent users of this technology may be less likely to answer our survey.

Benchmarking

When we compare our findings from PsoHappy to, for example, the results of The World Happiness Report, social desirability becomes of great importance. When mode effects are observed on socially sensitive survey items, they are sometimes attributed to social desirability effects. The underlying assumption is that a lack of anonymity, and/or a lack of perceived confidentiality, particularly in interview settings, may cause respondents to report higher levels of socially desirable attributes, including higher subjective well-being²⁷. Although several studies have disproven this effect, we acknowledge that some proportion of the happiness gaps we identify in PsoHappy could potentially be attributed to mode effects²⁸. However, this potential mode effect does not account for the variation of gaps between countries, severity and gender.

²⁷ OECD (2013), *OECD Guidelines on Measuring Subjective Well-being*, OECD

²⁸ Ibid.



Chapter 01

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Looking beyond physical hardship when bridging the psoriasis happiness gap

The purpose of this chapter is to set the scene for discussing happiness inequalities related to psoriasis, which are then elaborated and discussed further in the following chapters in this report.

The numbers presented in this introductory chapter emphasize how people living with self-reported psoriasis are very often subject to lower levels of happiness than their peers; in many cases these people live in a state of misery (defined as those who report 0-4 on the Cantril Scale). However, psoriasis-related inequalities in happiness vary a lot between countries, which may be explained by different factors presented in this chapter. These country variations in happiness should, however, not be mistaken for variation in happiness within a country.

The overall conclusion is that happiness inequalities are strongly driven by social and mental well-being, and not just by physical hardship (defined as living with one or several comorbidities).

Main insights

- Mexicans and Colombians living with self-reported psoriasis often thrive, while misery is more common in Australia, the UK and China.
- The country variations in happiness are potentially explained by culture (collectivistic versus individualistic), social comparison of utility and the prevalence of depression.
- The data suggest that people living with self-reported psoriasis do not adapt well to their diseases. This is especially true for women. This could be explained by difficulties adapting to mental health conditions.
- The prevalence of stress and loneliness for people living with self-reported psoriasis calls for more emphasis on mental and social well-being when assessing the general health and well-being of patients.

Sample information

All insights in this chapter are based on data from 21 countries.

Country	No. of subjects	% female	Median age
Brazil	9,786	53.5%	37
Russian Federation	8,717	42.7%	34
Spain	7,849	51.2%	41
United Kingdom	5,736	74.9%	42
Portugal	5,646	50.5%	39
France	5,451	73.8%	41
United States	4,875	66.7%	46
Italy	4,754	60.4%	43
Mexico	4,284	49.3%	35
Germany	4,246	70.1%	39
Colombia	4,075	49.9%	33
Canada	3,641	68.5%	45
Greece	1,893	68.3%	41
Australia	1,660	72.0%	44
Denmark	1,564	72.3%	41
Japan	1,427	53.6%	46
Norway	1,109	78.8%	43
Ireland	1,072	53.8%	40
China	810	47.3%	32
Czech Republic	631	59.6%	38
Belgium	410	59.3%	44



PsoHappy Profile: Rayanne

26 years old, Brazil

Psoriatic arthritis has brought me a lot of challenges, from daily activities like climbing stairs to the way people around me react to this condition. I was embarrassed when people on the street walked away from me, thinking I had something contagious, or when strangers told me I had mycosis [infection with a fungus] and should get a quick treatment.

How I wasn't diagnosed

Today, I know I have psoriatic arthritis, but it took me 10 years to find a name or meaning for this disease. I was treated like a teenager who just wanted to get attention. When I was 12, I heard the doctors say that I was faking pain; two years later, they warned my mother that I was focused on pain because I wanted to have access to narcotics.

At the age of 16, with the pain getting worse, I even lost my ability to walk – my immune system attacked the bone marrow. The doctors diagnosed an autoimmune disease, but they didn't know which. With the help of immunobiological remedies, the symptoms passed after three months, and with my mother's unending support and contagious positivism, I slowly regained the ability to walk. I always tried to lead my life as normally as possible – I finished school, I went to college and, as the years went by, I continued to search for a clearer diagnosis.

Finally, the diagnosis

When I was 22, I had my first skin psoriasis crisis, which covered at least 80% of

my body. During this time, I lost about 10 kilos and, as a consequence, some nodules appeared on my neck. Before this scenario, and once I'd had the diagnosis of autoimmune disease, the doctors were almost certain that I had leukemia in an advanced state. I quickly had biopsies performed on my neck and skin, and these confirmed something different: negative for leukemia and positive for psoriasis.

One year after this first crisis, which lasted for at least eight months, I was finally referred to a dermatologist specializing in psoriasis. By analyzing my medical history over the previous 10 years, I was finally diagnosed with psoriatic arthritis, which had manifested since I was 12.

Dealing with the disease

The skin patches and pain became part of my routine. One of my coping mechanisms is to always stay positive. I understood that I had to get through this in the best way and try not to let myself down. Being positive is the best way for me, and depending on the level of positivity, may even help my skin patches to get better.

I currently live in Porto, Portugal, but I still stay in contact with my dermatologist back in Brazil. I rely on my dermatologist fully and we use FaceTime to maintain regular appointments.

Be kind to yourself

It was serendipity the way I discovered PsoHappy. While I was taking the survey, I felt for the first time in my life a desire to share my story – all the ups and downs that are part of this journey. Yoga and meditation are part of my day-to-day life, and they help me to deal with this condition during the good and bad moments.

I believe that we need more people to understand this disease – it attacks silently, affects more than the skin and being questioned by strangers does not help at all.

I don't have a body that can withstand many physical pressures, but it has no limits whatsoever for dreams.



Many Mexicans and Colombians thrive, while British and Chinese people suffer



Figure 1.1 shows the average levels of happiness for people living with self-reported psoriasis (measured on the Cantril ladder scale from 0-10) for each country, based on data retrieved from the period 2017-2018. Since last year's report, the number of respondents represented in the ranking has increased from 63,107 respondents to 79,636 respondents (meaning that 16,529 additional respondents have been included this year). This increase is partly due to the inclusion of Belgium and the Czech Republic and partly due to increases of sample size for the already included countries.

With an even larger dataset, we also find slight changes in some of the country scores. For instance, the average level of happiness in Denmark has increased from 5.65 to 5.89, while the UK has dropped from 5.39 to 5.07. That makes the UK the unhappiest psoriasis population after China. The overall picture, however, remains the same as in last year's ranking: people living with self-reported psoriasis in Mexico and Colombia top the ranking, while China, the UK and Australia report the lowest average happiness levels in the survey. As shown in Figure 1.2, the relative positioning of the individual countries doesn't vary much according to severity levels.

In Figure 1.3 we have ranked countries based on their 'happiness gaps', which is the relative difference in measured happiness from the psoriasis population (based on self-reported psoriasis) to the general population of a specific country. The aim of calculating these happiness gaps is to give an indication of the happiness inequality caused by self-reported psoriasis.

For all severities we find that Portugal and Greece top the country ranking for happiness gaps. In the case of mild and moderate severity both countries report positive gaps, meaning the psoriasis population is even

happier than the general population. Only in the case of severe psoriasis do these populations also become subjective to a negative happiness gap.

The main reason that Portugal and Greece jump to the top of the ranking when assessing happiness gaps (rather than average happiness levels), is that the general population benchmark for the two countries show very low average happiness levels (5.68 for Portugal and 5.28 for Greece²⁹).

It is very important to note that the happiness gaps are relative in the sense that they capture a *difference*, and should therefore not be mistaken for absolute happiness levels. In other words: the Greek and Portuguese psoriasis populations are not the happiest populations nor the populations least often subject to misery. Rather, they are doing better than their fellow citizens.

In last year's report, as well as in this year's report, we have provided possible explanations as to why we witness these variations in happiness gaps between countries. The different explanations are not necessarily mutually exclusive. Four possible explanations are:

²⁹ Helliwell, J., Layard, R. & Sachs, J. (2018). *World Happiness Report 2018*, New York: Sustainable Development Solutions Network.



• **Whether the healthcare professionals understand the impact psoriasis has on mental health depends on the country**

One of the main insights from the World Psoriasis Happiness Report 2017 was that almost half of the psoriasis population feels that their healthcare professionals don't understand the impact the disease has on mental health, which is strongly correlated with unhappiness. In Chapter 4 we show how the frequency of such lack of understanding varies between country population in accordance with happiness gaps, suggesting that the acknowledgement of the impact the disease has, may be part of the explanation for the varying happiness gaps.



• **Mental health issues drive unhappiness**

As explored in Chapter 3, the prevalence of depression and other mental disorders varies among country populations according to the happiness gaps. This explanation fits into the general insight that happiness for people living with self-reported psoriasis is heavily dependent on one's mental health.



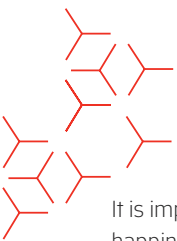
• **Collectivistic cultures shield against misery**

In the World Psoriasis Happiness Report 2017 we applied external data on collectivistic and individualistic culture, which showed a surprisingly strong correlation. All populations defined as being collectivistic - such as Colombia, Mexico and Portugal - tended to be subject to smaller happiness gaps than those populations that can be defined as individualistic - such as the US, the UK and Denmark. The link between happiness and collectivism was also explored for general populations in the 2018-edition of the World Happiness Report commissioned by the UN. A whole chapter was dedicated to the relatively high happiness levels in Latin American general populations, which concluded that the Latin American happiness has social foundations³⁰.



• **Social comparison makes it harder to live in an otherwise 'happy society'**

In last year's report, we described the assumption that people's happiness is very dependent on how other people are doing, and thus people with a debilitating condition may find it harder to live in an otherwise happy country.

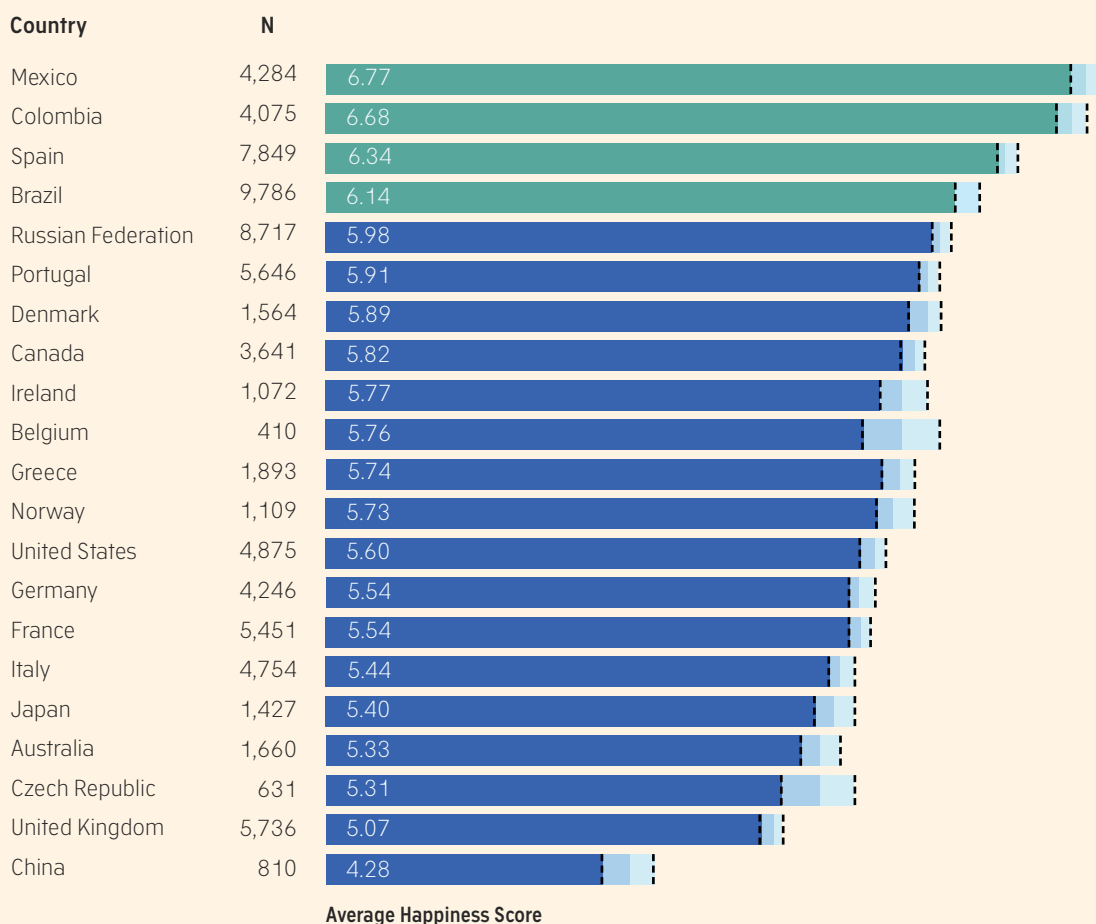


It is important to note that these explanations only apply to happiness variations *among* different countries and not to happiness variations *within* a country. These two should not be mistaken for each other, but they are both important to assess when we are aiming to determine how to bridge happiness inequalities.

³⁰ Helliwell, J., Layard, R. & Sachs, J. (2018). *World Happiness Report 2018*, New York: Sustainable Development Solutions Network



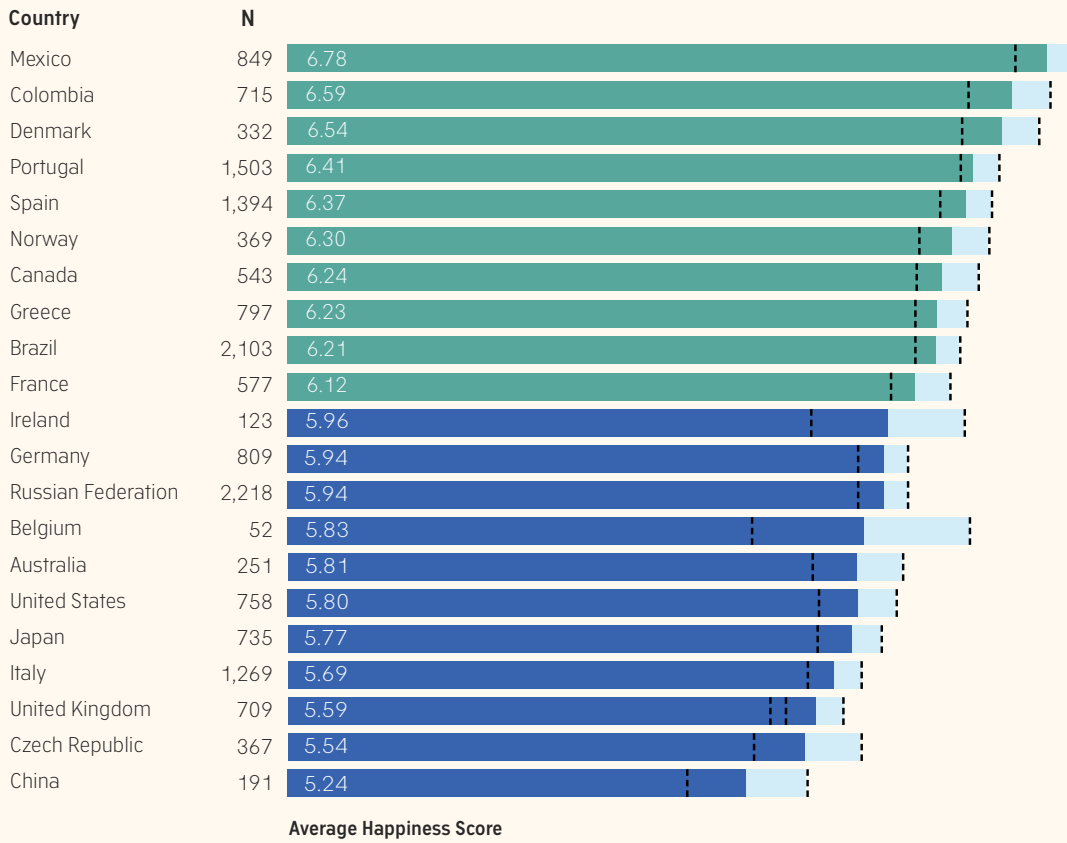
Figure 1.1: Country ranking: Psoriasis happiness levels per country³¹
(With 95% confidence interval bands)



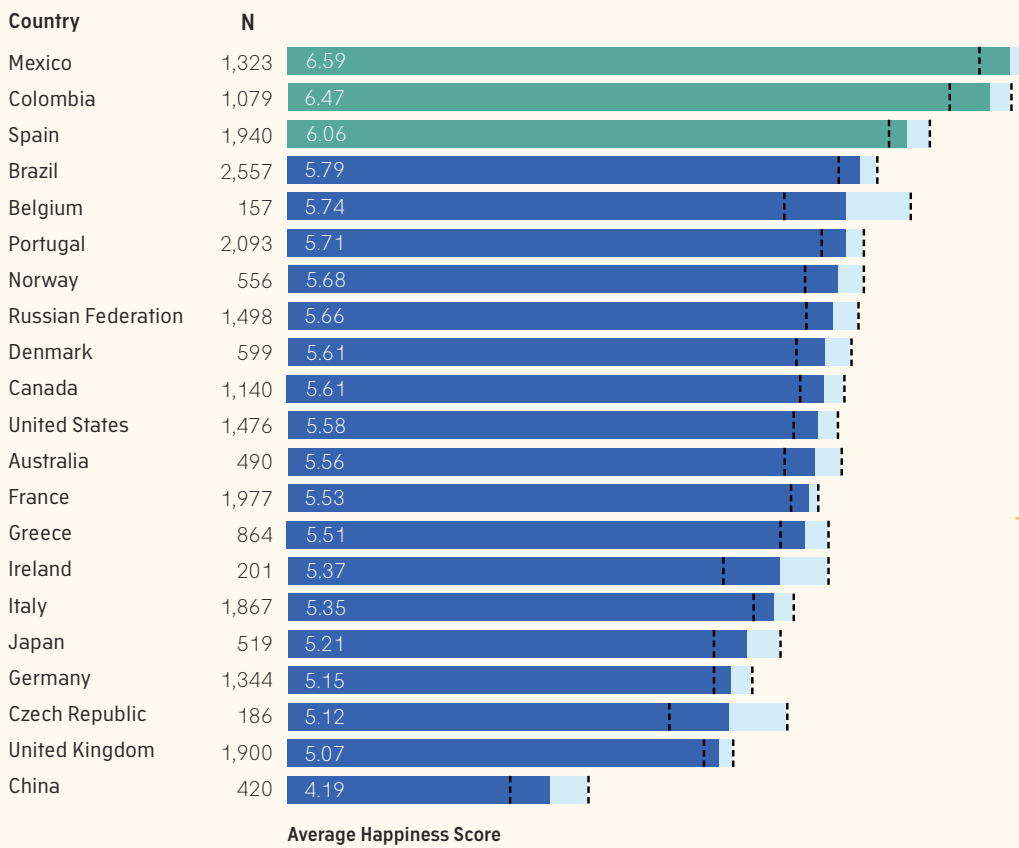
Average happiness score for each country. Colours show the score difference, with green indicating an average score higher than 6 and dark blue a lower average score. The context is filtered on Cantril Ladder which ranges from 0-10.

³¹ N=79,636

Figure 1.2: Country ranking: Psoriasis happiness levels per severity
Mild psoriasis³² (With 95% confidence interval bands)



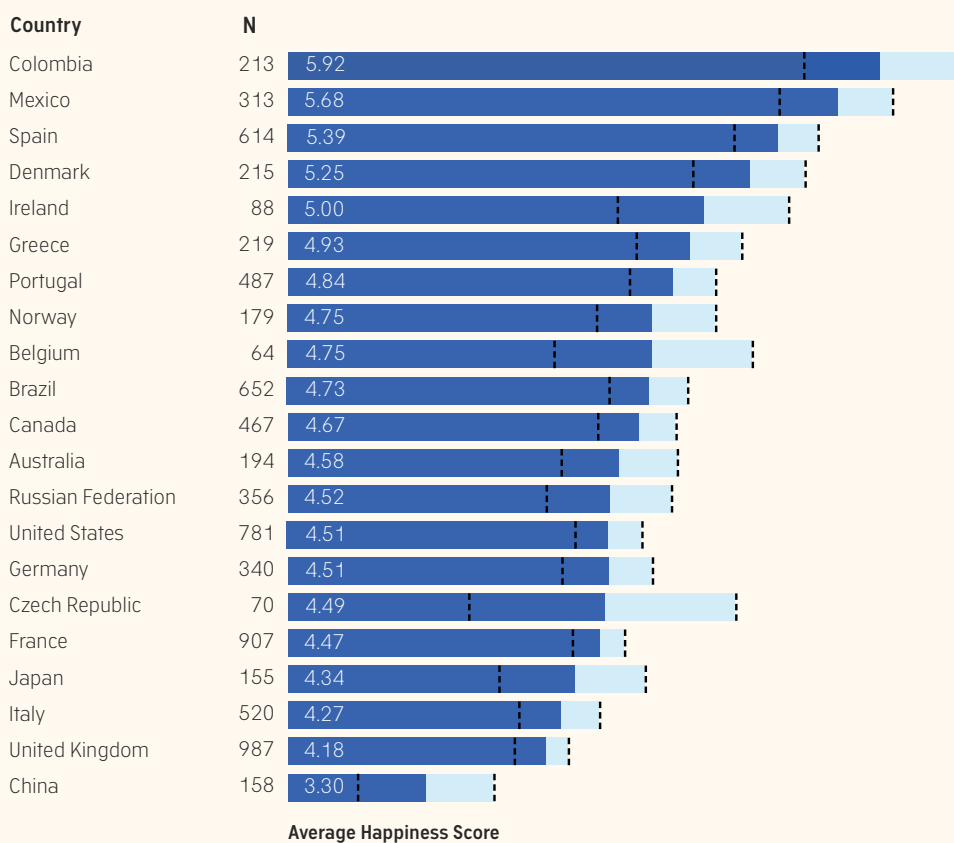
Moderate psoriasis³³ (With 95% confidence interval bands)



³² N=16,664

³³ N=24,186

Severe psoriasis³⁴ (With 95% confidence interval bands)

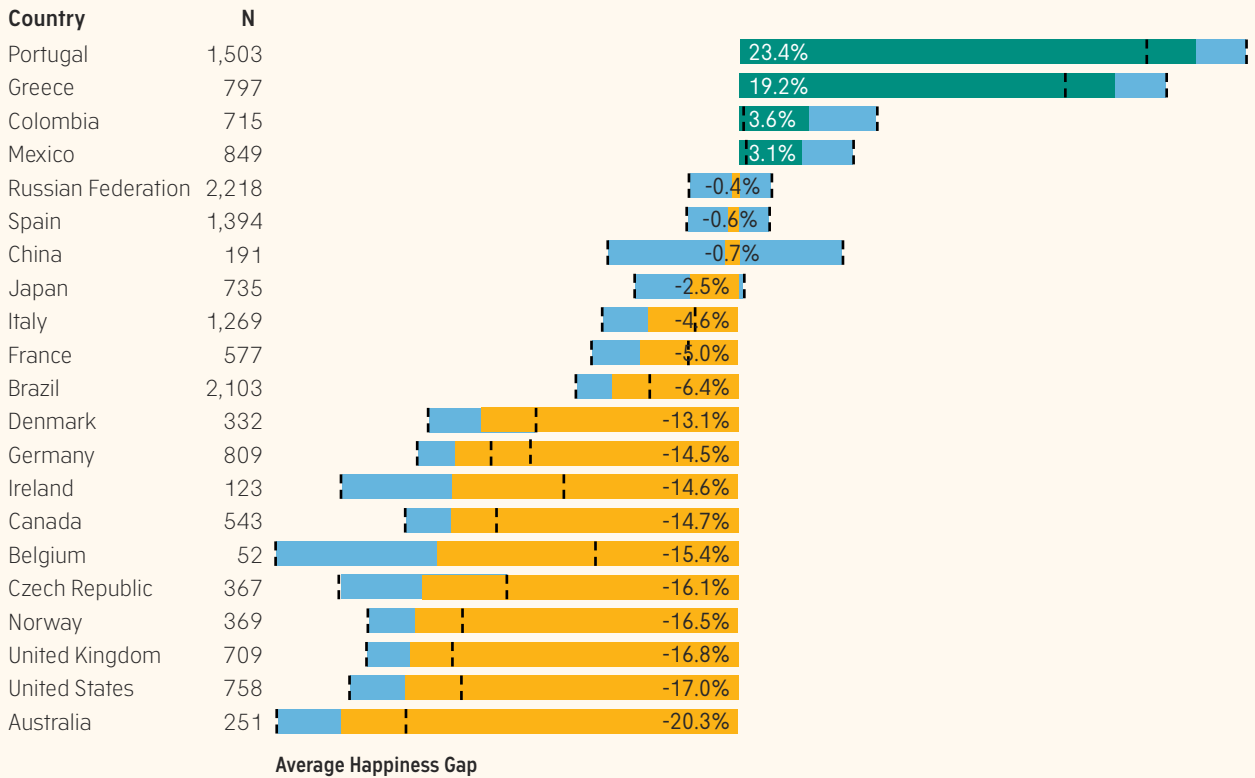


Average happiness scores for each country by severity. Colours show the score difference, with green indicating an average score higher than 6 and dark blue a lower average score. The context is filtered on Cantril Ladder which ranges from 0-10.

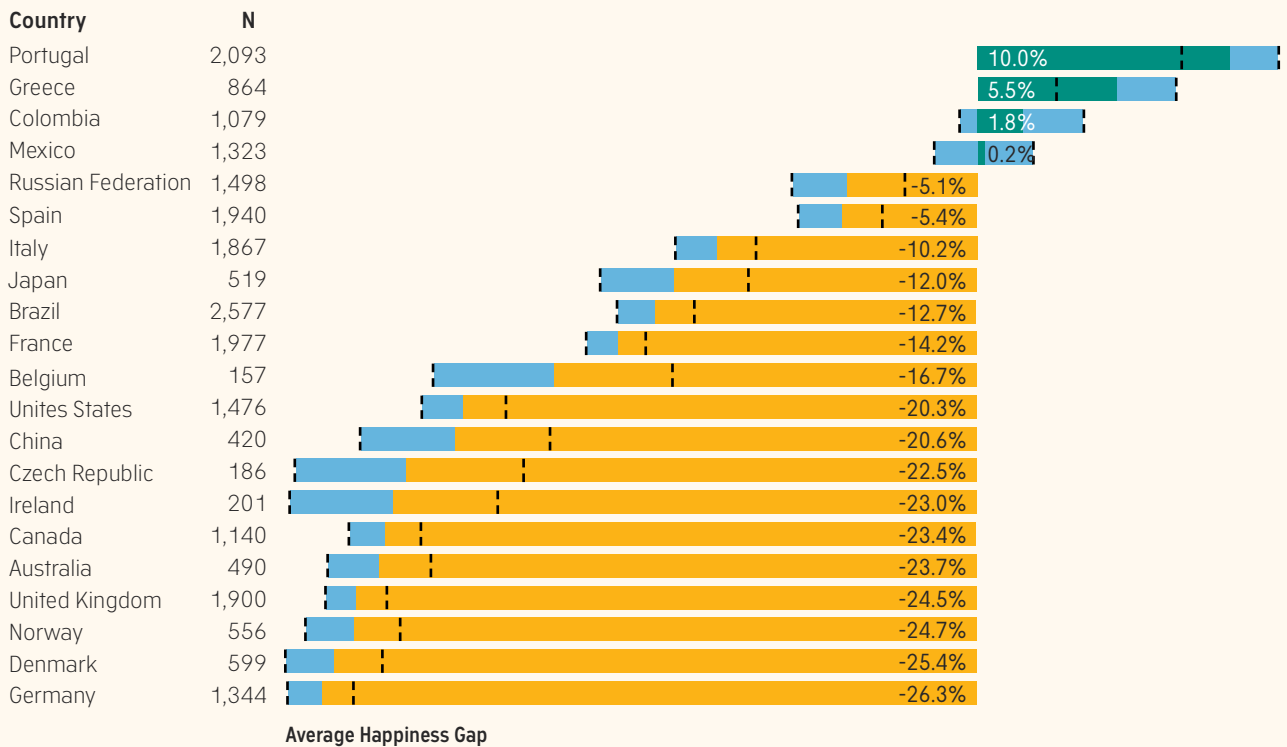


³⁴ N=7,979

Figure 1.3: Country ranking: Psoriasis happiness gaps per severity
Mild psoriasis³⁵ (With 95% confidence interval bands)



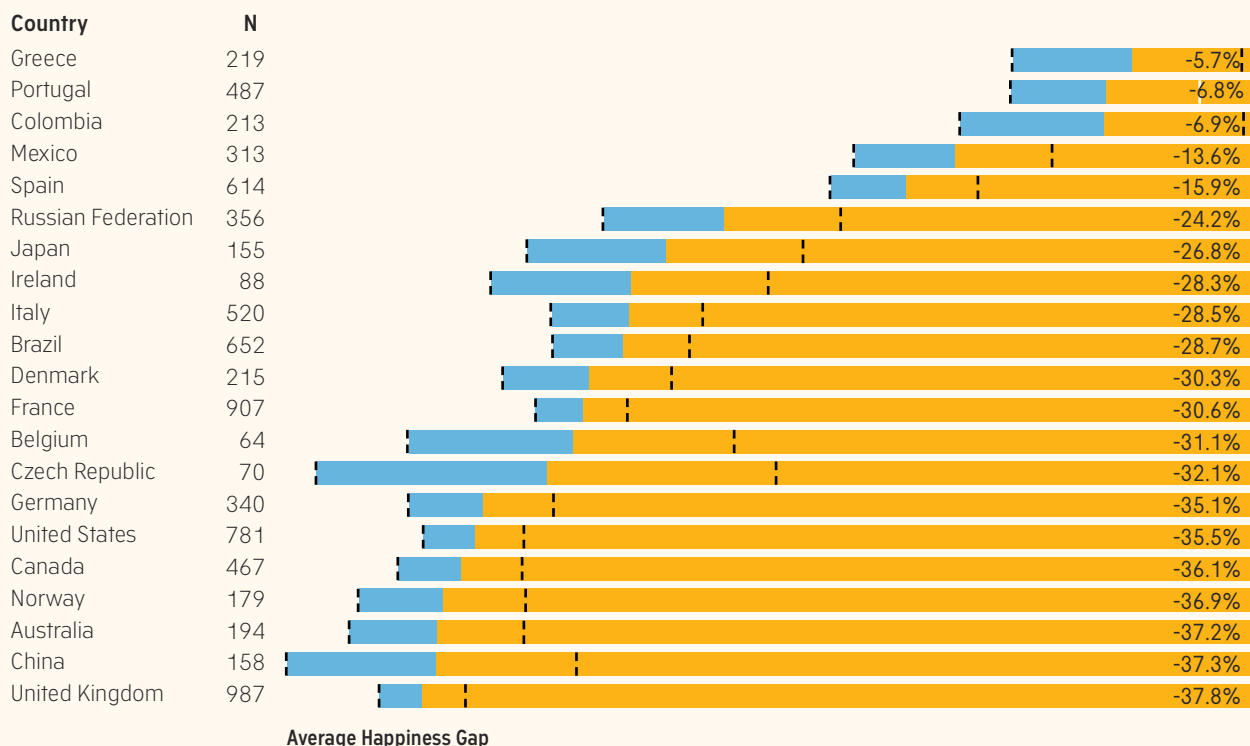
Moderate psoriasis³⁶ (With 95% confidence interval bands)



³⁵ N=16,664

³⁶ N=24,186

Severe psoriasis³⁷ (With 95% confidence interval bands)



Average happiness gaps for each country. Colors show the score difference, with green indicating a positive gap and yellow a negative gap. The context is filtered on 'Happiness gaps' (the average % difference between the happiness of people living with psoriasis and the happiness of the general population of the respective country).



³⁷ N=7,979

Happiness inequality measured as a ‘percentage of people in misery’

To give another perspective on happiness inequality, in addition to the happiness gaps we have also included a ranking based on the frequency of *misery* in each surveyed country. Misery is defined as those who report 0-4 on the 0-10 scale³⁸.

When ranking countries based on the frequency of people who are in misery, Mexico and Colombia ranked best in terms of limiting misery, with respective scores of 16.5% and 19% people in misery. In Australia, Japan, the United States, the Czech Republic and the UK, more than 30% of people living with self-reported psoriasis live in misery. In China, misery is the most common emotional state among those with self-reported psoriasis, with 51.4% of respondents reporting happiness scores between 0-4.

It's possible to benchmark these figures against the general populations using data insights from Gallup World Poll. This comparison provides some very concerning results. For instance, in the United States, data from Gallup World Poll shows that 3.5% of the general population report to be in misery³⁹. 32.3% of people living with self-perceived psoriasis in the US report the same. That means people living with psoriasis in the US are almost 10 times more likely to live in misery than Americans in general.



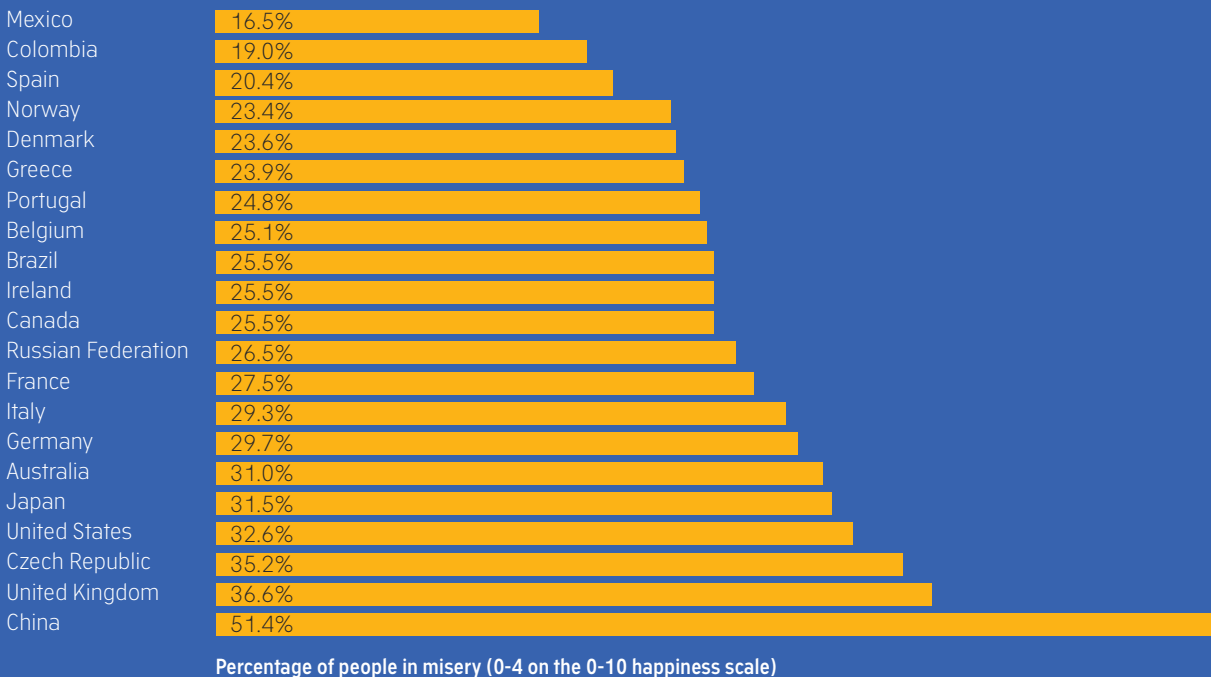
x10

People living with self-perceived psoriasis in the US are almost 10 times more likely to live in misery than Americans in general

30%

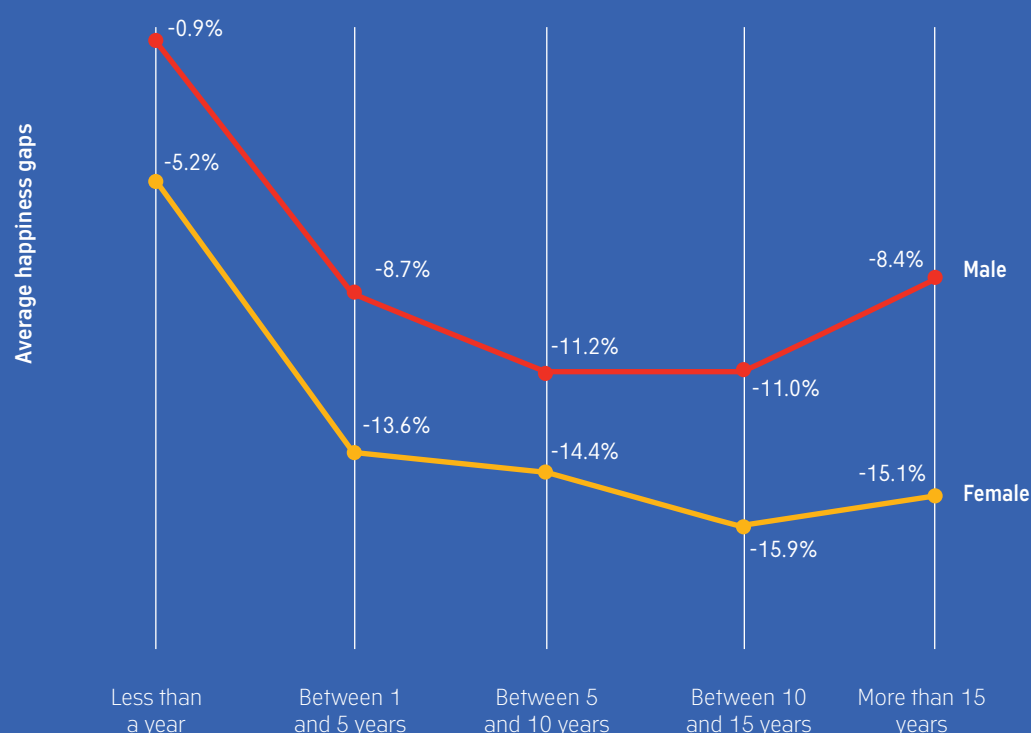
More than 30% of people living with self-reported psoriasis live in misery in Australia, Japan, the United States, the Czech Republic and the UK

Figure 1.4: Country ranking: Frequency of misery per country⁴⁰



³⁸ This is based on the tripartite breakdown used by the Gallup World Poll: <http://news.gallup.com/poll/122453/understanding-gallup-uses-cantril-scale.aspx> Global. We use ‘misery’ consistent to the World Happiness Report to reflect happiness scores between 0-4.

³⁹ Accessed through: <https://news.gallup.com/poll/151157/life-evaluation-weekly.aspx>

Figure 1.5: Years with Psoriasis and Average Happiness Gaps⁴³

Do people adapt to a life with psoriasis?

Studies have shown that people demonstrate considerable levels of adaptability to chronic health conditions. This means that being diagnosed with a disease most likely causes a drop in happiness levels, but as time passes, one learns to live with the disease⁴¹.

To properly test whether this holds true for people living with self-reported psoriasis would require a time-series of data, where we follow the same people through a period of years and measure their well-being. As such data is not yet provided by our platform, we have instead asked people for how many years they

have lived with psoriasis. Figure 1.5 shows the happiness gaps for people living with psoriasis based on how many years they have lived with the disease.

What we find is that both women and men experience minor happiness gaps within the first year of living with the disease. Interestingly, for both genders the happiness levels drops dramatically when they report to have lived with psoriasis for 1-5 years. The data does seem to suggest that some level of adaptation may occur, but mostly for men.

After living with psoriasis for more than 15 years, men on average report a happiness gap of -8.4% relative to the average -11.2%

for men who have lived with psoriasis between 5-10 years. It important to note, however, that a -8.4% happiness gap for men who have lived with psoriasis for 15 years is still a rather high number, and the data doesn't suggest that people ever adapt fully. From the descriptive data it is not suggested that adaptation occurs for women to the same extent as men.

One explanation as to why adaptation occurs less among people with psoriasis is because psoriasis is so strongly linked to mental health, and adapting to mental health conditions is difficult compared to other diagnoses⁴².

⁴⁰ N=79,636

⁴¹ Hurst, N.P., Jobanputra, M., Hunter, M., Lambert, M., Lockhead, A. & Brown, H. (1994) *Validity of EuroQol—a generic health status instrument—in patients with rheumatoid arthritis*. *Rheumatology*. 33(7), 655–662.

⁴² Dolan, P. (2011) *Using Happiness to Value Health*, Office for Health Economics, London

⁴³ N=47,635



Health is more than just the absence of physical hardship

The overall conclusion of the first World Psoriasis Report was that self-reported psoriasis is strongly linked to social and mental well-being, which we found manifested in a high frequency of people reporting to live in loneliness and have high stress levels. These numbers have also changed slightly since last year's report. In this year's report we find that the percentage living in loneliness varies from 19.5% in Portugal to 43.1% in the United States. These numbers are based on a conservative interpretation of loneliness.

Reported stress levels are high in all countries included in this analysis. The Norwegian population is the only population where the majority of people do not report high stress levels. In all the other countries surveyed, the level exceeds 50%; from 50.8% in Colombia to 75.3% in France.

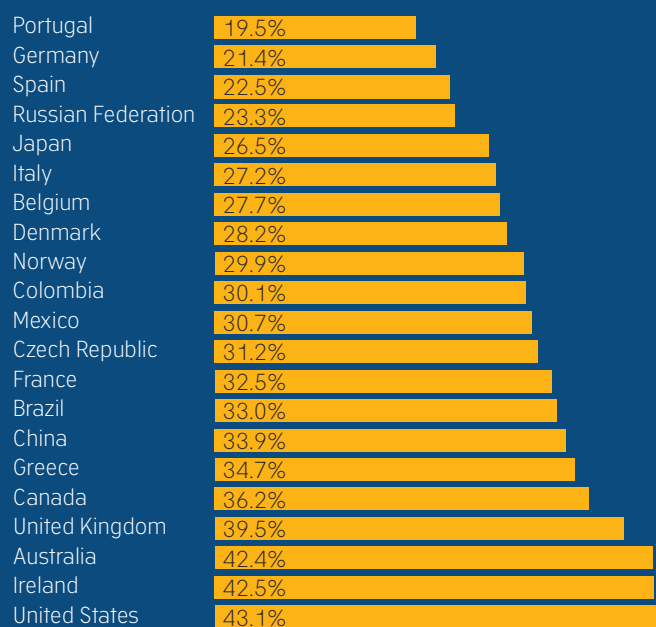
For the applied measure - Cohen's Perceived Stress Scale - different thresholds for 'high stress' are used in different studies, and it's questionable whether a threshold of '20' on a 0-40 scale (as we have used in the presented graph) is sufficiently conservative.

One way to assess the significance of our numbers is to benchmark them against general population surveys that have used the same measure.

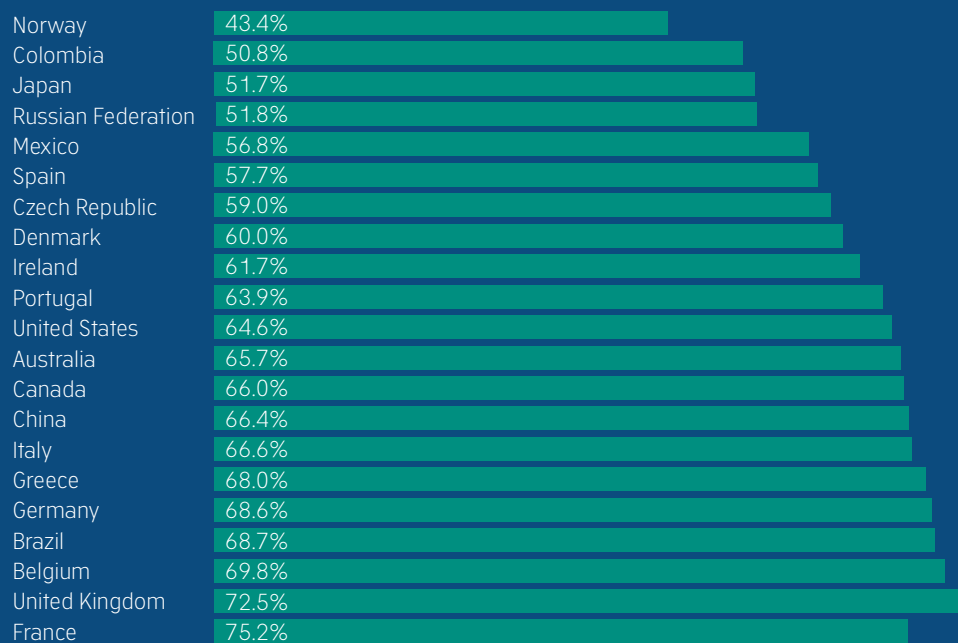
Regardless of the questionability of the thresholds, such a comparison provide us with information of the relative difference in stress between psoriasis patients and the general population.

A comparison can be made between the general population in Denmark and people living with self-reported psoriasis in Denmark. The threshold for high stress is set to '18' in the Danish general population survey, which shows that 25.1% experience high stress. If we apply the same threshold in our analysis we find that 70.2% of Danish people living with self-reported psoriasis experience high stress.

⁴⁴ Den Nationale Sundhedsprofil 2017 (accessed 5/6- 2018) via: <http://www.danskernessundhed.dk/>

Figure 1.6: Country ranking: Frequency of loneliness per country⁴⁵

Frequency of people living in loneliness

Figure 1.7: Country ranking: Frequency of high stress levels per country⁴⁶

Frequency of people living with high stress levels

⁴⁵ N= 18,540
⁴⁶ N=24,885



This year's report aims to dig deeper into these impacts and uncover ways to understand happiness dynamics in more detail.

The following chapter (Chapter 2) covers how living with self-reported psoriasis is costly both for the individual and society at large, but also how investing resources in happiness can help millions of lives and save billions of dollars.

Last year's report showed that we need to acknowledge that the happiness of people living with self-reported psoriasis is impacted by physiological well-being as well as - or perhaps even more by - social and mental well-being. Another crucial insight from last year's report was that almost half of all people living with self-reported psoriasis feel that their healthcare professional doesn't understand

how their disease impacts their well-being, which is strongly correlated with unhappiness. In Chapter 3 and 4 we explore further these core insights.

In Chapter 3 we analyse the relationship between physical, mental and social well-being by testing how multi-disease (living with several comorbidities), lifestyle and social life affect the overall happiness of people living with self-reported psoriasis.

In Chapter 4 we explore the healthcare professional-patient relationship and uncover the drivers of patient well-being.

Our ambition within these chapters is to present more actionable recommendations on the basis of the insights, for both the benefit of people living with psoriasis and society at large.



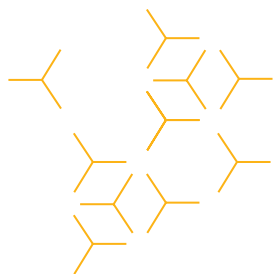
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Chapter 02

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The cost of psoriasis

Psoriasis has many costs both in monetary and human terms. In this chapter we address both.

We show how living with psoriasis is associated with unemployment and loss of productivity at work, which has a monetary cost for society. In addition, we also apply an approach that aims to show the 'human costs' of psoriasis measured in terms of well-being.

The underlying imperatives of maximizing economic output and ensuring good lives sometime unite, meaning both can be fulfilled simultaneously. In other cases, they present themselves as trade-offs, which raises obvious ethical dilemmas. Regardless of which approach one chooses to emphasize, we argue that society yet has many financial and human benefits to reap by investing in happiness.

Main insights:

- Being excluded from the workforce due to unemployment takes a huge toll on people's happiness and puts a monetary cost on society. In addition to this, people living with self-reported psoriasis who are part of the workforce are subject to lost productivity at work, which is also directly linked to monetary costs for society.
- It is costly for personal happiness to not have work colleagues that know about your psoriasis and provide support when needed. Furthermore, people are significantly unhappier when doing manual labour that entails coming into contact with hazardous conditions, relative to manual labour that doesn't. We also find that office jobs are linked to lower happiness if they don't involve customer facing roles.
- Reporting to be impacted by depression or anxiety is a strong predictor of lost productivity. Investing resources in happiness for people living with psoriasis does, however, holds the potential to greatly improve general well-being for individuals, as well as maximize economic output for society.

Sample information:

All insights in this chapter are based on data from 13 countries out of the 21 countries included in the ranking in Chapter 1.

Included and excluded countries

The following countries have been filtered out as they didn't reach the ideal minimum sample size (n=384):

Australia, Belgium, China, Colombia, Czech Republic, Ireland, Japan, Norway. The following countries have been included even though they did not reach the ideal sample size: Canada⁴⁷, Denmark⁴⁸, Russian Federation⁴⁹, United States⁵⁰

Disclaimers

In this chapter we encounter a significant gender bias as female respondents account for most of the sample (between 64.8% - 88.5%). Please be aware of this bias for all descriptive outputs that are not broken down by gender. In all insights based on regression analysis we adjust for gender.

Country	No. of subjects	% female	Median age
Brazil	562	78.2%	44
Italy	552	74.0%	43
France	501	85.8%	40
Greece	492	67.5%	39
Portugal	467	72.8%	41
Germany	432	86.3%	39
Spain	420	78.8%	41
United Kingdom	419	79.1%	45
Mexico	385	64.8%	41
Canada	321	85.7%	39
United States	269	88.5%	45
Denmark	259	77.4%	43
Russian Federation	211	71.1%	40

⁴⁷ Using a psoriasis prevalence estimate of 1.7% in Canada, a sample size of 321 creates a margin of error of 5% with a confidence interval of 95%.

⁴⁸ Using a psoriasis prevalence estimate of 3.73% in Denmark, a sample size of 259 creates a margin of error of 6% with a confidence interval of 95%.

⁴⁹ Using a psoriasis prevalence estimate of 4% in the Russian Federation, a sample size of 211 creates a margin of error of 7% with a confidence interval of 95%.

⁵⁰ Using a psoriasis prevalence estimate of 5.1% in the United States, a sample size of 269 creates a margin of error of 6% with a confidence interval of 95%.



PsoHappy Profile: Ron

58 years old, Canada

My psoriasis started when I was four or five years old. At that time, in the 1970's, people didn't know much about psoriasis but we accepted differences among people, so I didn't experience bullying in school. Psoriasis never prevented me from dating or living life to the fullest and my father always encouraged me by saying "just don't worry about it". In my twenties, I played city wide competitive football and, unfortunately, had a lot of injuries. That's when psoriatic arthritis began to appear. I was diagnosed with psoriatic and rheumatoid arthritis when I was just 25.

My career has changed, but I'm still trying to do what I like

In the past, I used to work with my hands a lot, repairing washers and fridges, but my condition made it so difficult. Now, I work as a consultant, looking after restaurants and teaching them how to serve customers. Sometimes, up to 70% of my body gets covered with flare-ups, and I've turned down jobs in the past because I didn't want my hands being exposed. Even on a hot summer day, I only wear long pants and sleeves to keep my skin from being exposed. But psoriasis and arthritis don't stop me from doing what I like. People should realize that they can still do a lot of things when they have this chronic condition.

I feel supported by the a healthcare system that works

Psoriasis treatment can be expensive but luckily we have a great healthcare system in Canada. If you can't afford medication, it's covered by the system. There are some

drugs that aren't covered, but very few. Itchiness, pain and lots of bleeding because you scratch are some of the worst symptoms, but I don't think psoriasis is as bad physically as it is emotionally. In Canada, the impact of psoriasis on mental health is taken seriously. I have a great relationship with healthcare professionals and my dermatologist always takes extra time to sit and listen to me. Psoriasis can lead to depression and every six months I fill out a survey about how I feel. But I don't think people are always honest with their doctors or spouses about their condition. The people who can really sympathize with you and understand what you're going through are the people who have it themselves.

I put my energy in helping others

Stress is a big trigger for psoriasis flare-ups, so reducing your stress level is important. My son was diagnosed with leukemia and, later that year, my daughter was diagnosed

with a brain tumor. Since then, she's had five surgeries. It was a very stressful time for me and it caused flare-ups like crazy. Luckily, my family was there to help me get through it.

When my son and daughter were diagnosed, I could drive them back and forth to the hospital. But in Ontario, 20% of cancer patients cannot get to their appointments. It's stressful not knowing how you will get to the doctor and I know a few cancer patients who also have psoriasis – it is very tough for them. Now, I run a cycling event to raise funds and support a transportation program for cancer patients, it's called Wheels of Hope. This is our sixth year for the cycling event and my goal is to ensure that no cancer patients have to worry about getting to their treatment sessions.

I want to help people living with psoriasis or psoriatic arthritis to know that they can live normal lives like anyone else, and that having a chronic disease is not the end of happy living.

What is the value of life?

There are different ways to consider the value of life. The most commonly used approach to determine value of life is by trying to calculate its monetary value, which is what the scientific field of ‘Health Economics’ is all about. Within this field, there is the so-called Human Capital Approach, which basically calculates the *discounted market value* of the economic output that an individual produces over a lifetime⁵¹.

This means that if a person is unemployed their entire life, their life essentially has zero value, regardless of what they have produced outside of the economic markets. The central metric to value life in this particular approach is therefore the income of an individual. This and other monetary approaches to value life clearly have serious limitations, as not all elements of life can be translated into monetary terms.

An alternative way to determine value of life is by measuring the happiness value of the individual. This could be done by simply asking people how their subjective well-being ranks on a scale from 0 to 10. That is the emphasis of the scientific field of ‘Happiness Economics’. The crucial difference is that the individual’s own assessment of their well-being is *stated* in happiness economics, while the health economics model focuses on how value is *revealed* through consumer and producer choices. In this chapter we define this alternative way to determine value of life as ‘human valuation’.

What we measure tends to become the target for what we want to achieve. Since we can easily measure weight, we tend to focus on weight loss over broader health concerns. Similarly, measuring everything in terms of its monetary value tends to lead us towards focusing on maximizing things like GDP growth, rather than a broad concept of human progress.

The monetary valuation of life presented here should therefore not be considered more than a means to an end. The end goal of determining the value of life in monetary terms is to maximize said value. After having determined the value of life, we can then

consider the difficult priorities that often need to be made when deciding whether to invest in cures for cancer or increase spending on treatments for chronic diseases. Such choices are complex and problematic, regardless of the approach taken.

In this chapter, we estimate the cost of psoriasis from a societal point of view in 13 countries. We then analyse the potential consequences of that cost, in strict monetary terms, followed by a discussion about how that cost relates to the happiness costs of people living with psoriasis. We conclude the chapter with a discussion about what should be done to minimize the costs of psoriasis, to both society and individuals.



⁵¹ Neun, S.P. and Santerre, R.E. (2007): *Health Economics: Theories, Insights, and Industry Studies*. 4th Ed. Mason: Thomson South-Western



The monetary cost of psoriasis

From a business and societal perspective, people's happiness is of great importance as it is directly linked to monetary costs and gains. Every day that employees can't go to work nor give their best efforts erodes productivity, costing companies and society at large millions of dollars.

By studying the reported hours of lost work due to absenteeism (when people do not go to work) and presenteeism (when people go to work, but feel they should have stayed at home), we are able to provide estimates on the cost to society and business of lost productivity. In this analysis we distinguish between the absenteeism and presenteeism caused by psoriasis and the absenteeism and presenteeism caused by other health issues.

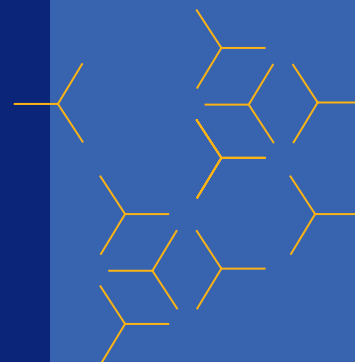




Table 2.1: Estimated cost on society from lost productivity
(Adjusted for purchase power parity)

	Annual cost Absenteeism (\$Million)	% Absenteeism due to psoriasis	Annual cost Presenteeism (\$Million)	% Presenteeism due to psoriasis	Total cost for people living with psoriasis (\$Million)	Total cost per 100.000 people in employment (\$Million)	Total cost as a percentage of GDP
Brazil	\$2,724	37.0%	\$689	55.8%	\$3,413	\$3.8	0.11%
Canada	\$586	34.1%	\$182	44.0%	\$767	\$4.1	0.05%
Denmark	\$531	30.8%	\$44	59.5%	\$574	\$20.2	0.20%
France	\$17,281	39.2%	\$3,215	60.6%	\$20,497	\$74.8	0.71%
Germany	\$14,416	41.4%	\$1,569	46.9%	\$15,985	\$38.5	0.38%
Greece	\$36	30.6%	\$21	63.2%	\$57	\$1.4	0.02%
Italy	\$2,184	42.9%	\$1,027	47.0%	\$3,211	\$14.5	0.13%
Mexico	\$920	63.1%	\$149	62.9%	\$1,070	\$1.9	0.05%
Portugal	\$179	35.4%	\$35	75.6%	\$215	\$4.5	0.06%
Russia	\$2,644	30.6%	\$806	83.5%	\$3,450	\$4.8	0.09%
Spain	\$1,083	32.6%	\$230	60.3%	\$1,313	\$6.9	0.07%
UK	\$2,174	50.8%	\$463	56.4%	\$2,638	\$8.1	0.09%
US	\$22,906	54.8%	\$7,611	68.0%	\$30,517	\$19.6	0.16%

To estimate the cost on society from lost productivity due to psoriasis, we have measured two parameters: absenteeism and presenteeism among the respondents in the study.

Absenteeism is measured by asking the following question: 'In the last 4 weeks, how many hours have you missed work because of psoriasis?'. **Presenteeism** is measured by asking the following question: 'During the past 4 weeks, how many hours have you worked when you felt that you should have stayed at home because of psoriasis?'

More information on the calculations behind this table can be found in the Chapter Appendix.

As shown in Table 2.1, the costs for society vary a lot by country. The highest total cost from absenteeism and presenteeism is found in the US where it adds up to \$30.5 billion annually. This cost estimation is similar to - but also more conservative than - another estimate suggesting that absenteeism and presenteeism for people living with psoriasis adds up to **\$36.4 billion**⁵².

Several considerations must be addressed when comparing the costs between countries. The total cost is dependent on factors such as the prevalence of psoriasis, the number of people in employment, monthly earnings and actual hours worked. All of these variables vary greatly by country. For instance, a high prevalence of psoriasis combined with a large general population could explain the high costs in the US.

In the last column in Table 2.1 we have created a more comparable benchmark by estimating the cost per 100,000 people in employment.

Note that this doesn't adjust for all the above-mentioned factors, but only the employment size differences. By making this adjustment we find that France is subject to the largest cost of all countries surveyed. In fact, the estimated cost for France is almost twice as large as the cost in Germany (the second largest cost) and 3.7 times bigger than the cost in Denmark (the third highest cost).

An intervention that could potentially lift productivity is the development of more inclusive work environments. As we explore later in this chapter, few people living with self-reported psoriasis experience that their co-workers know and care about their disease - a factor that is significantly linked to happiness⁵⁴. This indicates that many workplaces are yet to benefit from establishing more inclusive environments. Many managers may not, however, regard it as their responsibility to actively improve social well-being in the workplace, despite the fact that strong social relationships are among the most fundamental of human needs.

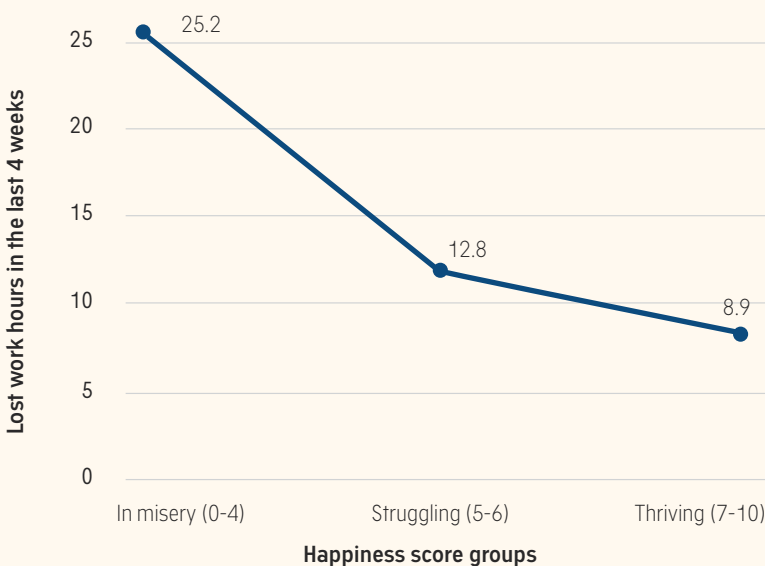
\$30.5bn

is the total cost from absenteeism and presenteeism in the US

25.2

work hours lost per 4 weeks due to psoriasis

Figure 2.1: Lost work hours due to psoriasis / Happiness distribution⁵³



⁵² Brezinski, E A., Dhillon, J S. & Armstrong, A W. (2015) *Economic Burden of Psoriasis in the United States A Systematic Review*, JAMA Dermatol Volume 151, Number 6

⁵³ N=2,857

⁵⁴ Rath, T., & Harter, J. (2010): *The Economics of Well-being*, Gallup Consulting.

In 2010, Gallup studied the impact of social well-being at work on an organization's productivity⁵⁵. By analyzing data from more than 20 million workers, they discovered that people who have high-quality friendships on the job *are seven times more likely to be engaged in their work than those who do not*. Yet, they found that just 8% of workers strongly agree that their organization helps them build stronger personal relationships.

Obviously, business leaders cannot force their employees into having better relationships, but they can create an environment in which people are more likely to build strong social networks, which, according to the numbers, may prove very beneficial not only for people living with psoriasis, but also for the bottom line.

In addition to testing lost productivity for people living with psoriasis, which can be given a monetary value, we have also tested the number of lost 'social hours' (hours missed or skipped dedicated to family, social or leisure activities).

Using the numbers for lost social hours, we can predict how big a negative impact it has on a person's happiness when they lose time dedicated to social activities. Unsurprisingly, we find this has a significant impact, which especially applies to people who lose 3 or more days of social activities over four weeks⁵⁶.

Measuring lost social hours instead of lost productivity is just one way to put a non-monetary value on something that is of great value to people. However, even though this value is non-monetary, it's still directly linked to money.

Time and money are comparable, and we see them both as scarce and valuable. However, according to Elizabeth Dunn, professor at the University of British Columbia, Ashley Whillans, assistant professor at Harvard Business School, and Aaron Weidmann, post-doctoral fellow at the University of Michigan, people tend to do a quite bad job of estimating their value properly⁵⁷.

Though money is extremely elastic, as it can theoretically be saved and accumulated over time, time itself is fixed and you can only ever have less of it. Following this logic, an hour should be worth more than a dollar, but people tend to act as if the opposite was true⁵⁸. Interestingly, Dunn, Weidmann and Whillans show how the people who do in fact value time over money, systematically report higher levels of happiness⁵⁹.



⁵⁵ Whillans A V, Weidman A C, & Dunn E W. (2016) *Valuing Time Over Money Is Associated With Greater Happiness*. Social Psychological and Personality Science, Vol 7, Issue 3, pp. 213 - 222

⁵⁶ See Appendix A

⁵⁷ Whillans A V, Weidman A C, & Dunn E W. (2016) *Valuing Time Over Money Is Associated With Greater Happiness*. Social Psychological and Personality Science, Vol 7, Issue 3, pp. 213 - 222

⁵⁸ Ibid.

⁵⁹ Ibid.



The human cost of psoriasis

While the previous section mainly assesses the cost of psoriasis in monetary terms, this section aims to show the more human costs of psoriasis related to job status and work life. We know that people in employment are generally happier than unemployed people⁶⁰, and this is also very much the case for people living with self-reported psoriasis as it will be shown in this analysis.

Happiness and work are important to investigate, simply because we spend so much time of our everyday life at work. Because of this, work plays a role in our happiness in more aspects than just income. As stated in the World Happiness Report 2017: *'The importance of having a job extends far beyond the salary attached to it, with non-pecuniary aspects*

*of employment such as social status, social relations, daily structure, and goals all exerting a strong influence on people's happiness*⁶¹.

In this section we investigate the importance of having a job relative to other employment statuses. We distinguish between being: 'employed for wages', 'self-employed', 'a student', 'a homemaker', 'retired', 'out of work and not looking for a job', 'out of work but looking for a job' and 'unable to work'. We also adjust for additional variables that may be related to job outcomes as well as happiness. This includes gender, age, severity and marital status. Finally, we also adjust for the number of working hours. All of these variables are included to avoid a bias where demographic variables drive both job outcomes and

happiness and thus lead us to false conclusions on the links between work life and happiness.

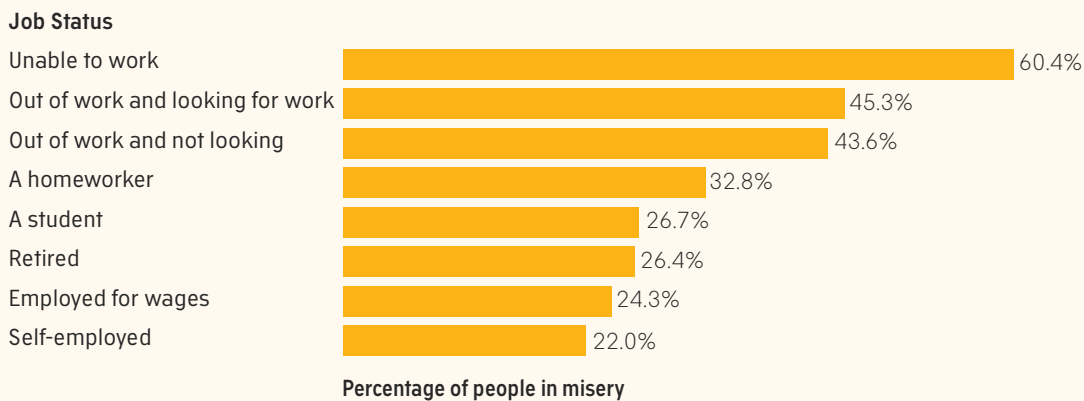
The results on job status and happiness are very clear. As shown in Appendix B and descriptively in Figure 2.2, being unemployed is strongly associated with unhappiness, but being permanently excluded from the labour market by an inability to work is - in the majority of cases - linked to misery.

The regression analysis shows that having an inability to work has the greatest negative impact on happiness of all work statuses, and Figure 2.2 shows how the majority of these people (60.4%) live in misery. In comparison, 24.3% of employed people live in misery.

⁶⁰ Helliwell, J., Layard, R., & Sachs, J. (2017). *World Happiness Report 2017*, New York: Sustainable Development Solutions Network.

⁶¹ Ibid.

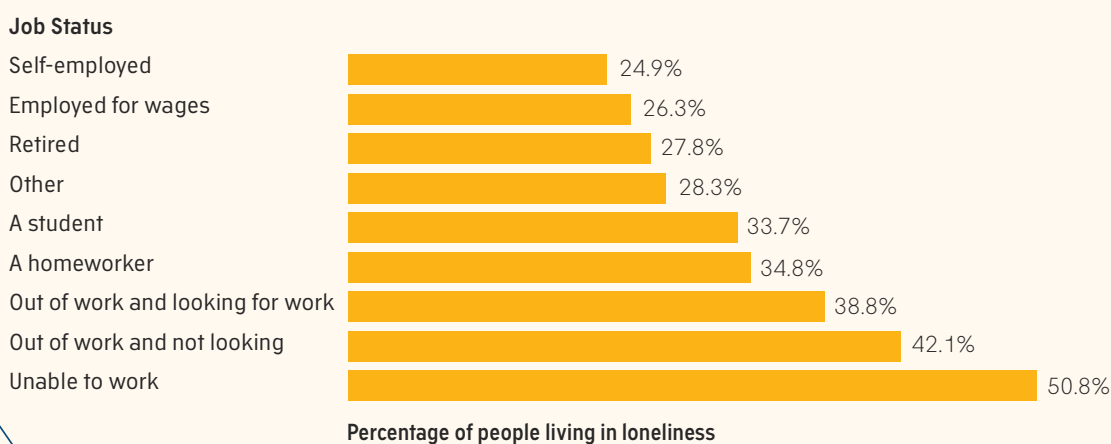
Figure 2.2: Percentage living in misery per job type⁶².



As we shall explore in Chapter 3, it is not the number of comorbidities that makes one unhappy, but more how the comorbidities keep one from being part of a working community. Even though inability to work may very well be caused by multi

disease, its consequences go for beyond physical pain. As shown in Figure 2.3, 50.8% of all people who are unable to work also live in loneliness - even when adopting a conservative interpretation of loneliness.

Figure 2.3: Percentage living in loneliness per job type⁶³.



⁶² N= 22,166 (This graph is based on data retrieved from the general base of respondents and is not limited to data used in this chapter)

⁶³ N=9,486 (This graph is based on data retrieved from the general base of respondents and is not limited to data used in this chapter)



When discussing the ‘human cost of psoriasis’ - as we do in this chapter - we need to be aware that the people that suffer the most are the ones permanently excluded from the labour market due to the severity of their disease. When acknowledging the human value of this group of people as equal to other people, and accepting the imperative that we should focus our efforts where happiness is most scarce, these people naturally become of particular priority due to their misery and experienced hardship.

If we, on the other hand, adopted a strict monetary cost-assessment, as conducted in the previous section, it is very unlikely that unemployed people and especially those who are unable to work would be considered to have an equivalent value as with the aforementioned approach. Even though intervention aimed at lifting this group out of misery may also reduce costs on society to some extent (for instance through a decreased consumption of public health services), it is likely that a monetary and a human valuation of lives would still present a trade-off, even in this case.

It is, however, not only the permanently unemployed who are subject to hardships. We find similar issues among unemployed people who could be part of the labour market again.

Firstly, this group of job-searching people are subject to the most misery and highest frequency of loneliness

after the group of people who are unable to work. Secondly, research suggests that the non-income effects of being unemployed has a five times larger effect on happiness than lower income caused by unemployment⁶⁴. And thirdly, research shows that the misery associated with unemployment is not that short-lived. While people experience an initial large drop in their happiness when first becoming unemployed, it seems that their happiness remains low if they stay unemployed over time⁶⁵. Unemployment is therefore not one of the difficult life circumstances that people can adapt to.

But the problem doesn't stop there. Studies have shown that even once the individual gets back into employment, the prior experience of joblessness leaves a mark on their happiness. When comparing people who are in work, those who have recently experienced a bout of unemployment are systematically less happy than those who have not⁶⁶.

In addition to investigating the importance of having a job, our data also allows us to ask whether different types of jobs are associated with higher or lower levels of subjective happiness.

We distinguish between four different job types⁶⁷, which allows us to gain a sense of the extent to which different types of employment are associated with happiness when studying people living with self-reported psoriasis.

Table 2.2: Ranking of job types based on their correlation with happiness⁶⁸

Ranking (1 equals ‘the happiest’)	Job types
1	Office based, spend most of my day at my computer, customer facing
2	Manual labour, not coming into contact with hazardous conditions
3	Office based, spend most of the day at my computer, no customer facing
4	Manual labour, maneuvering machinery or coming often into contact with hazardous conditions

⁶⁴ Helliwell, J.F. & Huang, H. (2011) *New Measures of the Costs of Unemployment: Evidence from the Subjective Well-Being of 2.3 Million Americans*, Economic Inquiry.

⁶⁵ Helliwell, J., Layard, R., & Sachs, J. (2017). *World Happiness Report 2017*, New York: Sustainable Development Solutions Network

⁶⁶ Ibid.

⁶⁷ The available categories cover: ‘Office based, spend most of my day at my computer, customer facing’; ‘Office based, spend most of the day at my computer, no customer facing’; ‘Manual labour, not coming into contact with hazardous conditions’; and ‘Manual labour, maneuvering machinery or coming often into contact with hazardous conditions’.

After controlling for age, gender, severity, working hours etc. we find that people who do manual labour, maneuvering machinery or often come into contact with hazardous conditions, are significantly unhappier than those with other jobs (See Table 2.2).

The happiest people are the ones who have office-based jobs that involve customer-facing roles. Office jobs that don't involve customer-facing roles are less correlated with happiness than manual labour, as long as it doesn't entail coming into contact with hazardous conditions.

Finally, we also tested the importance of social factors at work. Even though having a job is much better than not having a job for one's happiness, of course some social environments are better at promoting happiness than others. Acknowledging that employment is, for many, more than just a source of income, we have investigated which social factors can be linked to happiness specifically for people living with self-reported psoriasis.

To investigate this impact, we asked the respondents whether they agreed or disagreed with these four statements:

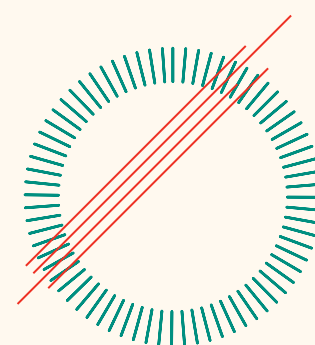
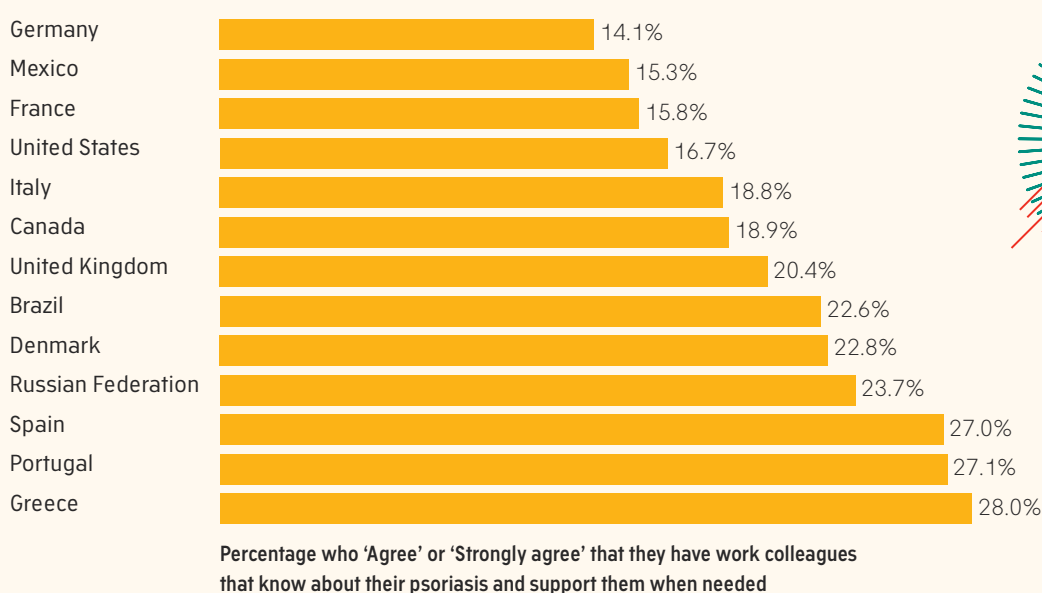
- 1) 'The company I work for has formal and informal systems in place to help me manage my psoriasis'
- 2) 'My manager understands the impact psoriasis has on me and my work performance'
- 3) 'My work colleagues know about my psoriasis and I get their support when needed'
- 4) 'I have a close co-worker who understands what it means to live with psoriasis and we often talk about the impact it has on my work life'.

Of all four factors we only find factor 3 - 'My work colleagues know about my psoriasis and I get their support when needed' - to be significant⁶⁹. It does however have a substantial effect. This also means that formal or informal systems, an understanding manager, or a very close co-worker, interestingly are without any effect. An interpretation of this result could be that the well-being of people living with self-reported psoriasis is more dependent on having acknowledging and inclusive social environments, than simply having one-on-one relationships that attempt to provide the same.



Job-searching people are subject to the most misery and highest frequency of loneliness after the group of people who are unable to work.

Figure 2.4: Percentage who agree they have work colleagues that know about their psoriasis⁷⁰



⁶⁸ This ranking is based on the regression output - See appendix C.

⁶⁹ See Appendix D

⁷⁰ N=3,847



Investing in happiness is a necessity, not a luxury

Being excluded from the workforce through unemployment is extremely detrimental to happiness. This applies to people in general and for people living with psoriasis. However, earlier in this chapter it was questioned whether employment alone is sufficient to lift people out of misery.

A group of people for which employment is not a solution to misery, is for those who are unable to work. This group becomes of great concern as they happen to be the ones who experience the most hardship in life.

While temporary and permanent exclusion from the workforce have significant costs on individual lives, unemployment and productivity

loss for people who are part of the workforce also induce heavy costs on society.

According to the World Health Organization, mental health disorders - depression and anxiety in particular - are the main cause of lost productivity for the general population. The estimated global cost is \$1 trillion dollars annually⁷¹. In our survey, we also find that depression and anxiety take a huge toll on productivity. People who report to be highly impacted by depression and anxiety state they missed an average of 26.5 work hours during the last 4 weeks. In comparison, people who are not at all impacted by depression or anxiety only report to have missed an average of 7.3 work hours during the last 4 weeks (see Figure 2.5).



\$1 tn.

is the estimated global annual cost for lost productivity for the general population, due to mental health disorders - depression and anxiety in particular.

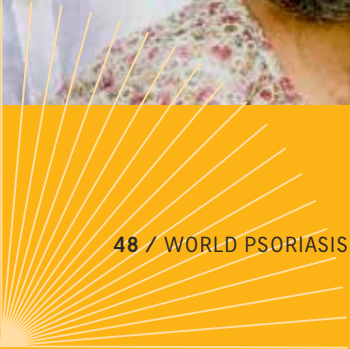
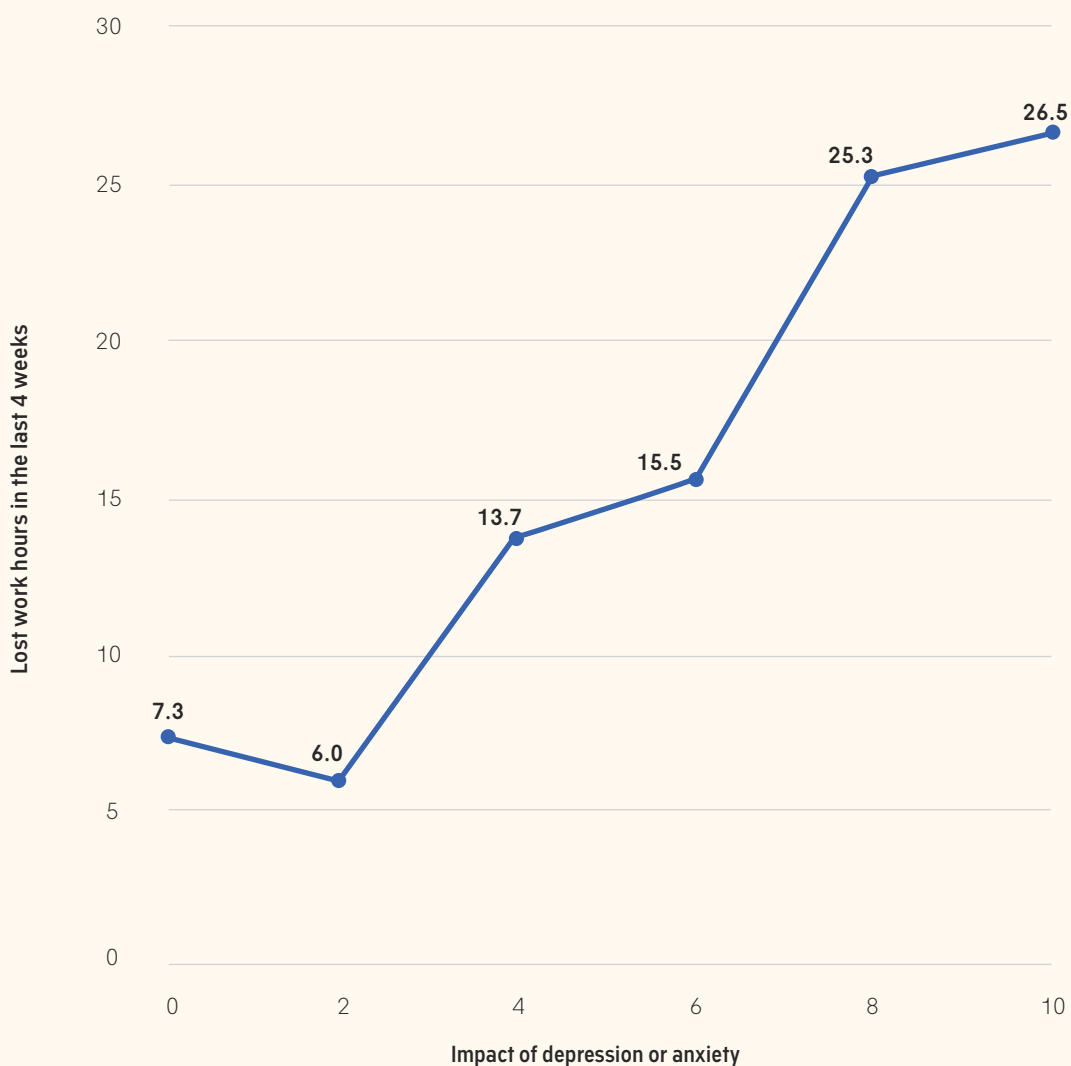


Figure 2.5: Impact of depression or anxiety on lost work hours⁷²



Psoriasis is sometimes defined as a physical condition. However, for many people who live with the condition, it affects both their mental health and social life. In fact, 1 in 4 people report to suffer from depression or other mental disorders. Up to 43% people with

psoriasis suffer from loneliness in the US and up to 75% experience high stress levels in France. Thus, if we are to lift people out of misery (and maximize economic output simultaneously) we should focus our efforts on – and invest our resources in – mental health and social life.



75% of people with psoriasis in France experience high levels of stress

⁷¹ Chisholm, D., Sweeny, K., Sheehan, p., Rasmussen, B., Smit, F., Cuijpers, P. & Saxena, S. (2017): *Scaling-up treatment of depression and anxiety: a global return on investment analysis*, World Health Organization

⁷² N=1,819

In the World Happiness Report 2017, it was documented how treating more people for mental health disorders is by far the cheapest policy to lift people out of misery⁷³. In fact, attempting to reach the same economic gains through job creation (active labor market policies) is estimated to be 3 times more expensive.

Happiness policies imply an immediate (but relatively insignificant) expenditure, but it is estimated to bring massive benefits. In OECD countries, mental health is estimated to reduce net GDP by 5% through disabilities, absenteeism, presenteeism and increased costs towards healthcare services⁷⁴. More importantly, the net cost of treating these problems is negative. Successful treatments lead to gains in productivity, in output and in lower costs towards healthcare services. When everything is accounted for, the total gains far exceed the total costs of the treatment. This conclusion has been repeatedly supported, e.g. by the WHO and Global Happiness Council^{75, 76}.

People living with psoriasis are often highly impacted by poor mental health. Policies that target these problems and make treatment accessible, hold the potential to help millions of lives and save billions of dollars. The evidence suggests that investing in happiness is a necessity, not a luxury.

Whilst these insights mainly address the important challenges of mental health, we also argue that we must draw our attention to social well-being, loneliness in particular. This is the main concern in the two following chapters. In these we argue that a greater focus from the healthcare system

and from healthcare professionals on how people living with psoriasis are social beings - and not just patients suffering from a physical condition - could improve general well-being for many.

Finally, we want to address the potential for 'ethical dilemmas' which we briefly touched on earlier in this chapter. We have argued that the underlying imperative of the monetary valuation of human lives (maximizing economic output) and the human valuation of human lives (creating good lives) *can* unite, by targeted investments that aim to lift people out of misery.

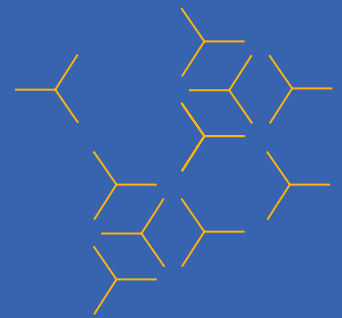
Still, one could easily imagine instances where the two do not align, meaning that lifting people out of misery does not bring immediate gains in economic output. This could be applied in the case of people who are unable to work due to their illness, as investments in their happiness wouldn't bring about obvious productivity gains - for good reasons.

From a pure monetary perspective, such people are regarded as 'costs', but for many it is inappropriate and cynical to weigh the lives of people who are too ill to work solely in terms of monetary costs. It would also be bold to claim that this is in fact the only consideration applied in the relevant policy making today. However, as our data clearly shows, people who are unable to work are subjected to a lot of suffering. This suggests that the present political imperatives aren't sufficiently addressing the above-mentioned issues, which in turn calls for a stronger emphasis on the human valuation of lives addressed by happiness assessments.

5%

In OECD countries, mental health is estimated to reduce net GDP by 5% through disabilities, absenteeism, presenteeism and increased costs towards healthcare services.

The ambition of this report is to promote a stronger governmental and societal emphasis on the imperative of lifting people out of misery. Such an emphasis could help facilitate a much-needed conversation about the necessity of well-being improvements for people living with psoriasis and for people with other chronic health conditions, regardless of their job-capabilities.



⁷³ Helliwell, J., Layard, R., & Sachs, J. (2017). World Happiness Report 2017, New York: Sustainable Development Solutions Network.

⁷⁴ Layard, R. (2018) *Mental Illness Destroys Happiness And Is Costless To Treat*, in Global Happiness Policy Report (2018), World Government Summit, United Arab Emirates.

⁷⁵ Chisholm, D., Sweeny, K., Sheehan, p., Rasmussen, B., Smit, F., Cuijpers, P. & Saxena, S. (2017): Scaling-up treatment of depression and anxiety: a global return on investment analysis, World Health Organization

⁷⁶ Layard, R. (2018) *Mental Illness Destroys Happiness And Is Costless To Treat*, in Global Happiness Policy Report (2018), World Government Summit, United Arab Emirates.

Chapter Appendix

In this chapter, we surveyed people with psoriasis on their professions and the impact psoriasis has on their worklife. Two parameters were of particular interest, evaluated on the basis of the questions:

1. **In the last 4 weeks**, how many hours have you missed work because of psoriasis? (Absenteeism)
2. **During the past 4 weeks**, how many hours have you worked when you felt that you should have stayed at home because of psoriasis? (Presenteeism)

For question 2, we also asked respondents to evaluate how productive they were during those hours, on a scale from 0 to 100.

Based on those numbers, we are able to calculate lost productivity, by using the human capital approach. The final results are shown in Table 2.1, but how we reach those numbers is explained here. We simply apply the Cost model:

$$C_{ijk} = \frac{I_{ij}}{T_{ij}} \cdot H_{ijk} \cdot L_{ij} \cdot PP_i$$

where C is the total cost of lost productivity per year. I is the average income, T is the average actual hours worked per week, H is the average hours of work lost due to psoriasis, L is the country's (employed) labour force and PP is the psoriasis population as a percentage of the total population. We've made the assumption that the psoriasis population is the same within the labour force as in the total population. Psoriasis occurs more frequently with age, and thus this

assumption makes our estimate more conservative, as the labour force and our sample are both based on people older than 15 years, thus we would expect a higher percentage of people with psoriasis in the labour force than in the entire population. The subscripts indicate for which groups we have data, i being the 13 countries mentioned, j being the gender and k being the cause of lacking productivity, i.e. absenteeism and presenteeism.

Example: In Brazil, we have the following data for males' absenteeism:

I	T	H	L	PP
\$1,144 per month	40 hours per week	10 hours per 4 weeks	52,480,000 males in employment	1.3%

When correcting for the different intervals, we end up with the following equation:

$$C_{\text{Brazil, M, Absenteeism}} = \frac{\$1,144 \text{ per month}}{40 \frac{\text{hours}}{\text{week}} \cdot \frac{52 \text{ weeks}}{12 \text{ months}} \cdot \text{year}} \cdot 10 \text{ hours/week} \cdot \frac{52 \text{ weeks/year}}{4 \text{ weeks}} \cdot 52,480,000 \text{ pax} \cdot 1.3\%$$

From that equation, we find that Brazil misses out on \$582,803,977.22 per year due to lost productivity caused by absenteeism among people living with psoriasis.

When we combine that number with absenteeism from females in Brazil who live with psoriasis (\$425,268,273.29 per year), we get a total lost productivity caused by



psoriasis which equals \$1,008,072,250.51 per year. For males and females combined, we find that absenteeism caused by other conditions than psoriasis are responsible for lost productivity of an estimated \$1,715,936,158.88 per year.

Thus the total annual cost of absenteeism follows from the sum of the two: \$2,724,008,409.39 per year. This is the amount shown in the first column of Table 2.1.

By relating the total lost productivity to absenteeism caused by psoriasis per year, to the total lost productivity to absenteeism caused by any condition, we find that \$1.008 billion constitutes 37.0% of the total \$2.724

billion. This is the amount shown in the second column of Table 2.1. The same calculations have been made for presenteeism, as reported in column 3 and 4 of Table 2.1. The 5th column simply sums the above \$2.724 billion caused by absenteeism and \$0.689 billion caused by presenteeism, to the total cost of the lost productivity among people living with psoriasis.

Finally, we relate the total costs to the size of the labour force and to the GDP, respectively. Thus we obtain results that can be compared across countries. It should be noted that the main causes of the differences between countries come from the following:

H, the average amount of hours of lost work.

This is the estimate obtained from our own survey, and even though it is volatile, our sample is sufficiently large that we should get meaningful estimates. However, they still vary from around 1 hour per 4 weeks among males in Greece who experience absenteeism caused by psoriasis, to 29 hours per 4 weeks among males in France who experience absenteeism caused by other conditions. There might be many reasons behind why people report such high figures in France, compared to Greece, but theories about those reasons lie beyond the scope of this report.

PP, the percentage of the population that lives with psoriasis

This estimate is obtained from various sources, most of which have been reported by the WHO World Psoriasis Report. However, the figure varies from 1,3% in Brazil to 5,17% in France, which means the French results are more than doubled just because of this parameter. This is perhaps the most volatile estimate in the cost model, as the research design varies so much between the studies that have reported different numbers. We hope there will be a standardized definition of psoriasis, and that research design to estimate such numbers at a national level will also be more standardized in the near future.

L, Labour Force

This estimate is taken from the International Labour Organization (ILO) Labour Force Survey 2016. We actually use the amount of people employed in a given country, which gives a more accurate estimate of the cost of lost productivity, given that the unemployment rate remains fairly constant.

I, monthly income

This measure is taken from the ILO's Labour Force Survey in various years. The figure given is adjusted for the Purchase Power Parity (PPP), which means it takes into account the living cost in a given country. I.e. for a country like Mexico, the peso salary is much lower than the € salary in Denmark, however the living costs in Mexico are also substantially lower. Therefore, the PPP adjusted income makes it easier for us to compare the numbers across countries. The PPP is based on a "basket of goods", and there is a lot of controversy about how exactly it is calculated and which goods should be included. Regardless, the adjustment is not made every year in every country, and thus it is not completely up to date everywhere. The oldest PPP adjustment is from US (based on 2010).

T, average actual hours worked per week

This estimate is taken from ILO's Labour Force Survey, and is based on an average across all sectors in the economy. The survey question asks respondents how many hours they actually work per week, which is most likely more accurate than the amount of contracted hours. Across every country, we see that women work less than men, to various degrees. Mexican males work 50 hours per week on average and Mexican women work 40 hours per week. Meanwhile, Danish males work 37 hours per week on average, and Danish females work 32 hours per week on average.

To sum up the estimates and their effect on our results in Table 2.1, the main differences are caused by how big a part of the population lives with psoriasis, and how many hours those people are not able to work due to absenteeism and/or presenteeism. The size of the labour force is important for the total cost, but not when we evaluate the total cost per 100.000 workers, as done in Table 2.1. The size of the economy in GDP terms is also important for the total cost, especially since this is often correlated with monthly income, however we evaluate the total cost as a percentage of GDP in Table 2.1, to account for that.

Regression

Model A (1 and 2): The output below shows the effect on happiness from lost social time, controlling for gender, age, relationship status (and psoriasis severity in Model A2) (N = 5276).

REGRESSION RESULTS (CANTRIL LADDER AS DEPENDENT VARIABLE)

	Model A1	Model A2
Intercept	6.82*** (0.11)	7.13*** (0.11)
Gender baseline: Female		
Gender – Male	0.28*** (0.07)	0.32*** (0.07)
Age		
	-0.00 (0.00)	0.00 (0.00)
Partner baseline: Married or in a relationship		
Partner - 'Other'	-0.35*** (0.11)	-0.39*** (0.10)
Partner - Single	-0.37*** (0.06)	-0.38** (0.06)
Severity baseline: Mild		
Severity - Moderate	- -	-0.38*** (0.07)
Severity - Severe	- -	-1.25*** (0.08)
Social baseline: 0 days		
Social - 1 day	-0.69*** (0.07)	-0.53*** (0.07)
Social - 2 days	-0.88*** (0.10)	-0.62*** (0.10)
Social - 3+ days	-1.47*** (0,07)	-1.09*** (0.08)
P-values: 0 '****' 0.001 '***' 0.01 '**' 0.1 '*' 0.05		

Model B: The output below shows the effect on happiness, from occupation type and weekly work hours, when controlling for gender, age, relationship status and psoriasis severity (N = 4623)

Model C: The effect on happiness from job type and work hours, controlling for gender, age, relationship status and psoriasis severity (N = 4623).

Model D: The effect on happiness from hours worked and workplace's understanding of psoriasis, controlling for gender, age, relationship status and psoriasis severity (N = 3709).

REGRESSION RESULTS (CANTRIL LADDER AS DEPENDENT VARIABLE)

	Model B	Model C	Model D
Intercept	7.09*** (0.13)	6.68*** (0.15)	6.89*** (0.23)
Gender baseline: Female			
Gender – Male	0.32*** (0.07)	0.40*** (0.07)	0.29* (0.13)
Age			
	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Partner baseline: Married or in a relationship			
Partner - 'Other'	-0.28* (0.11)	-0.26* (0.11)	0.20 (0.22)
Partner - Single			
	-0.43*** (0.06)	-0.44*** (0.06)	-0.34** (0.11)
Severity baseline: Mild			
Severity - Moderate	-0.67*** (0.07)	-0.68*** (0.07)	-0.74*** (0.13)
Severity - Severe	-1.65*** (0.08)	-1.71*** (0.08)	-1.52*** (0.15)

Occupation baseline: Employed for wages

Occupation - A homemaker	-0.15 (0.17)	-	-
Occupation - A student	0.03 (0.23)	-	-

Occupation - Other

	0.27 (0.14)	-	-
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Occupation - Out of work and looking for work

	-0.61*** (0.16)	-	-
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Occupation - Out of work and not looking

	-0.73** (0.23)	-	-
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Occupation - Retired

	0.45* (0.18)	-	-
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Occupation - Self-employed

	0.20* (0.09)	-	-
--	-----------------	---	---

Occupation - Unable to work

	-1.15*** (0.19)	-	-
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Type of work baseline: Manual Labour, maneuvering machinery or often being in contact with hazardous conditions

Type of work - Manual labour, no hazard	-	0.45*** (0.11)	-
Type of work - Office based with some customer facing	-	0.48*** (0.11)	-
Type of work - Office based, no customer facing	-	0.23* (0.11)	-
Type of work - Other	-	0.43*** (0.10)	-



Workplace Experiences (dummy variables, i.e. baseline: 0 equivalent to 'disagree')

Workplace Experience: I have a close co-worker who understands what it means to live with psoriasis, and we often talk about it	-	-	0.04 (0.14)
Workplace Experience: My manager understands the impact psoriasis has on me and my work performance?	-	-	0.02 (0.21)
Workplace Experience: My work colleagues know about my psoriasis and they support me	-	-	0.43** (0.16)
Workplace Experience: My company has formal/informal systems to help me manage my psoriasis?	-	-	-0.20 (0.21)

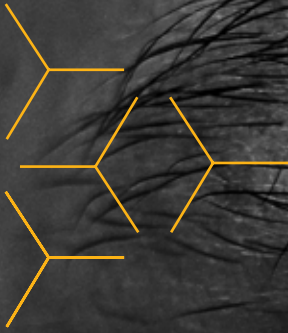
Weekly work hours baseline: 35 to 45 hours

Weekly work hours - Less than 20 hours	-0.16* (0.08)	-0.40*** (0.08)	-0.23 (0.15)
Weekly work hours - 20 to 35 hours	-0.18 (0.09)	-0.17* (0.07)	-0.05 (0.14)
Weekly work hours - More than 45 hours	0.00 (0.08)	0.00 (0.08)	0.33* (0.14)

P-values: 0 '*' 0.001 '**' 0.01 '*' 0.1 '**' 0.05**



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Chapter 03

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Comorbidities, lifestyle and happiness

People living with psoriasis are at risk of developing other health conditions, also known as comorbidities. In this chapter we seek to uncover the links between happiness, lifestyle factors and several comorbid conditions.

Comorbid conditions and bad lifestyle habits extensively affect the quality of life of people living with psoriasis. Social and mental conditions that disrupt the ability to function normally in daily life - such as stress or loneliness - are stronger predictors of overall well-being than more objective health observations. The care of patients with psoriasis should therefore consider how humans are social beings,

and the impact that social isolation caused by the condition has on overall happiness and well-being.

Main insights:

- The effect of *multi-disease* (experiencing several comorbidities measured from 0-3+ comorbidities) on happiness is (at least partly) explained by inability to work.
- Of all comorbidities surveyed, the presence of depression or other mental disorders and back pain drives the highest levels of unhappiness.
- Bad lifestyle habits (for example, smoking, drinking, eating unhealthy and never exercising) are associated with unhappiness. However, the study revealed that people with a greater number of comorbidities tend to have better lifestyle habits. A surprising finding is that people

who never drink are subject to higher happiness gaps and more comorbidities than people who drink up to 10-19 drinks per week. That 'never drinking' is linked to unhappiness can be explained by the observation that these people more often report to be lonely than the people who drink up to 10-19 drinks per week, though this only applies to women.

- Even though bad lifestyle habits and some comorbidities (depression and other mental illnesses, back pain and liver diseases) are associated with unhappiness, conditions that cause emotional disruption or trauma - such as loneliness and stress - are better predictors of overall well-being. Loneliness is also one of the strongest predictors of the number of comorbidities a person is likely to experience.

Sample information:

All insights in this chapter are based on data from 13 countries out of the 21 countries included in the ranking in Chapter 1.

Included and excluded countries

The following countries has been filtered out as they do not reach the ideal minimum sample size (n=384): Belgium, Canada, China, Colombia, Czech Republic, Denmark, Ireland, Mexico

The following countries has been included even though they do not reach the ideal sample size: Japan⁷⁷

Disclaimers

In this chapter we encounter a significant gender bias as female respondents account for most of the sample (Between 64.1% - 86.6%). Please be aware of this bias for all descriptive outputs that are not broken down by gender. In all insights based on regression analysis we adjust for gender.

Country	No. of subjects	% female	Median age
Brazil	799	77.5%	40
United Kingdom	571	76.9%	47
France	560	80.8%	39
United States	522	85.4%	54
Germany	517	80.5%	38
Canada	484	80.5%	46
Portugal	415	64.1%	40
Spain	407	86.6%	38
Australia	405	79.0%	47
Italy	405	76.2%	39
Russian Federation	391	67.8%	41
Norway	388	80.8%	43
Japan	380	60.4%	46

⁷⁷ Using a psoriasis prevalence estimate of 0.44% in Japan, a sample size of 380 creates a margin of error of 5% with a confidence interval of 95%.



PsoHappy Profile: Alex

29 years old, Denmark

It's not the first thing I tell people – 'Hi, I'm Alex. I've got psoriasis'. But I can't really hide it from the people who are closest to me. My friends and girlfriend are actually very supportive. I've been lucky; my symptoms aren't so bad that people would notice immediately. I've seen other people with psoriasis who have it far worse than me, and I can imagine they have a much harder time trying to live with it.

Many people think that psoriasis is only a skin disorder, but it's a genetic immune disorder. It could lead to heart disease and diabetes. Skin is the least of it, and not many people know that. Creating more awareness about psoriasis would definitely be helpful.



Psoriasis and depression

I was really young – 14 or 15 years old – when my depression started, and I've carried it with me since. Psoriasis came on top of that when I was 20. Until then, I'd had no symptoms, but suddenly psoriasis was just there. My symptoms became worse and I was so stressed out that it wore me down – it was just one long downward spiral.

When I started researching, I realised how much psoriasis is connected to your emotions and your thoughts about it. My psoriasis is much better now than it was. I'm slowly learning to live with it, but every day when I'm interacting with other people, I'm thinking about whether they'll notice my flare-ups. And if they do, what do they think about it – will they think it's contagious? You've got all these semi-paranoid thoughts going on which don't do you any good. The trick is to educate yourself a little bit and realise that psoriasis is not as bad as you sometimes make it out to be.

I'd like my dermatologist to really listen to me

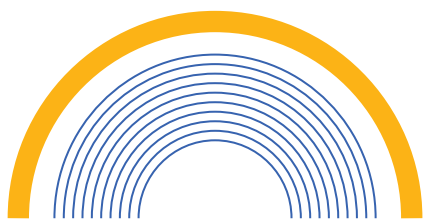
General practitioners have a lot of patients throughout the day, so I understand that they don't take much more than five minutes with you, before sending you to a specialist. But it's much more frustrating when the specialist rushes you through a standard book and one kind of treatment that probably isn't going to work. Maybe you've even tried it before, but the dermatologist still insists on going through the same seven or eight treatments that they always use, instead of looking at your individual situation. You feel as if you're being treated as a generic psoriasis patient.

It's a strange feeling coming to see a doctor and realising that she's not really trying to understand what your problem is. It takes some extra energy from the dermatologist's side to actually listen and not rush the patient through a ready-made solution.

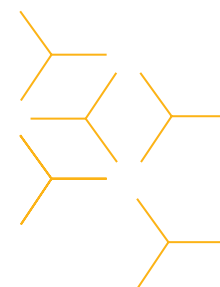
Everyone appreciates being listened to, and if people felt their dermatologist was really listening to them, I think they would have a greater trust, not only in their doctor but in the whole treatment system.

Build your coping mechanism

I have a bad habit of overthinking, and that has led to a lot of the anxiety I've felt having psoriasis, and the fears about people noticing it. I've tried to stop listening and just tell myself "Calm down, it's not as bad as you think it is, and people don't notice". Calling my own bluff has really been my major coping mechanism. My particular psoriasis symptoms are stress-related, so for me it's more important to focus on my way of thinking, and less important that I follow a certain diet or get the right amount of exercise. So the coping mechanism for me is to relax and stop myself from running amok mentally.



Unhappiness is linked to specific comorbidities



At a first glance, happiness is not correlated with *multi-disease* (experiencing several comorbidities measured from from 0-3+ comorbidities). We find that the correlation between the two are not statistically significant when running a regression analysis that takes all relevant factors into account⁷⁸.

However, when we omit the category 'unable to work' from the model, we find that the effect of the amount of comorbidities becomes statistically significant for patients with 3 or more comorbidities⁷⁹.

The assumption behind the result is that multi-disease patients are often unable to work, which strongly correlates to unhappiness. However, if the cause of those patients not being able to work is that they have several comorbidities, then having 3 or more comorbidities is the underlying reason why people are less happy - though it is exacerbated by their inability to work.

While multi-disease only seems to affect happiness through the inability to work, the presence of very specific comorbidities does affect happiness.

We find that *depression and other mental illnesses, liver diseases and back pain* all have a significant negative impact on people's lives⁸⁰.

There is no significant effect from conditions such as diabetes or other metabolic diseases and high blood pressure. Though our analysis shows that the majority of comorbidities doesn't affect happiness, this doesn't necessarily mean that these conditions aren't linked to unhappiness. In these cases there is reason to believe that it is not the presence of pain from the specific comorbidity that affects happiness. As with the example mentioned above, having more comorbidities is only statistically significant when we omit 'unable to work', which means people are not unhappy because of their comorbidity, but rather because their comorbidity makes them unable to work, which makes them unhappy. Likewise, we find that having an ulcer is only statistically significant when we omit the stress-variable, which indicates that people with an ulcer are not unhappy because of their ulcer, but rather because having an ulcer is often related to being stressed, and the stress is what makes people unhappy. We call the inability to work and stress confounding factors.

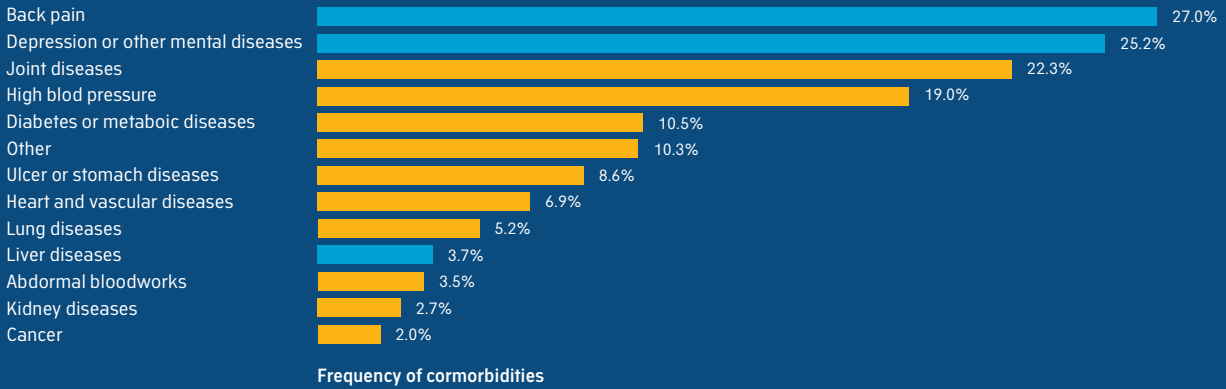
The three comorbidities that have a direct link to unhappiness - depression and other mental illnesses, back pain and liver diseases - are far from being equally frequent in the population surveyed. As illustrated in Figure 3.1 and 3.2 both back pain and depression and other mental illnesses are the most common comorbidities for people living with self-reported psoriasis according to this survey while liver diseases are rather uncommon.

⁷⁸ See Appendix: A

⁷⁹ Ibid.

⁸⁰ Ibid.

Figure 3.1: Frequency of comorbidities⁸¹



About Figure 3.1: Back pain, depression or other mental disorders and liver diseases are highlighted in this graph to indicate that only these comorbidities have a significant negative impact on subjective well-being.

Figure 3.2: Frequency of comorbidities per country⁸²

	Australia	Brazil	Canada	France	Germany	Italy	Japan	Norway	Portugal	Russian Federation	Spain	UK	US
Cancer	1.7%	1.5%	2.7%	1.3%	1.5%	2.5%	3.7%	2.3%	2.9%	0.8%	1.0%	1.8%	3.6%
Kidney diseases	3.2%	3.4%	2.1%	1.6%	2.1%	1.0%	1.6%	0.8%	2.4%	9.2%	2.2%	2.1%	3.4%
Abnormal bloodworks	4.2%	2.5%	3.7%	4.1%	4.4%	3.5%	3.2%	2.1%	2.9%	0.8%	3.2%	4.6%	5.54%
Liver diseases	4.2%	6.0%	2.7%	1.6%	2.5%	1.0%	8.2%	1.3%	1.7%	10.0%	2.7%	1.9%	4.8%
Lung diseases	5.7%	6.3%	4.8%	4.1%	5.6%	3.2%	1.6%	9.6%	4.6%	4.1%	4.4%	5.3%	7.3%
Heart and vascular diseases	5.4%	7.4%	6.0%	5.4%	6.8%	4.2%	5.5%	5.7%	7.0%	15.9%	3.2%	6.5%	10.2%
Ulcer or stomach diseases	7.9%	9.4%	7.6%	6.4%	7.4%	8.1%	6.6%	12.6%	7.0%	15.1%	6.4%	6.5%	11.5%
Other	17.3%	7.5%	13.8%	9.6%	10.3%	10.4%	6.6%	12.6%	9.9%	6.1%	10.1%	11.2%	10.0%
Diabetes or metabolic diseases	12.8%	12.0%	12.8%	5.2%	8.3%	5.2%	12.4%	14.9%	3.1%	6.9%	4.7%	12.3%	22.8%
High blood pressure	21.5%	21.9%	19.6%	11.3%	15.5%	13.6%	16.6%	14.7%	15.9%	17.4%	10.3%	20.5%	41.8%
Joint diseases	23.2%	18.6%	25.4%	14.8%	27.7%	14.6%	11.1%	27.3%	18.1%	18.9%	14.3%	30.5%	41.0%
Depression or other mental diseases	42.0%	26.3%	31.0%	14.8%	35.6%	7.4%	20.5%	19.3%	16.4%	10.2%	20.4%	34.2%	40.2%
Back pain	28.6%	25.5%	24.6%	31.1%	30.8%	25.7%	17.6%	24.2%	23.1%	29.4%	26.5%	25.7%	34.7%
None of the above	20.7%	23.5%	24.0%	35.9%	25.0%	39.5%	36.1%	22.4%	35.9%	26.1%	38.6%	26.3%	12.5%

Moreover, depression or other mental disorders are far more common among women than men: women living with self-perceived psoriasis are almost twice as likely to be suffering from a mental health condition than men (See Figure 3.3). Women more often suffer from back pain, depression, joint diseases, ulcer and stomach diseases, while men more often suffer from high blood pressure and heart and vascular diseases.

⁸¹ N=6,244

⁸² N=6,244



The analysis suggests that the effect from comorbidities on happiness are very dependent on the experience of depression or other mental health conditions as well as back pain. Thus, in populations where these conditions are more common, we would expect the happiness gaps to be larger. We have exemplified this in Figure 3.4 with a country correlation between depression and other mental disorders and happiness gaps.

We find that in countries where depression is highly frequent (as the US, the UK and Australia) happiness gaps are significantly larger than in countries where depression is less frequent (as Russian Federation, Portugal and Italy).

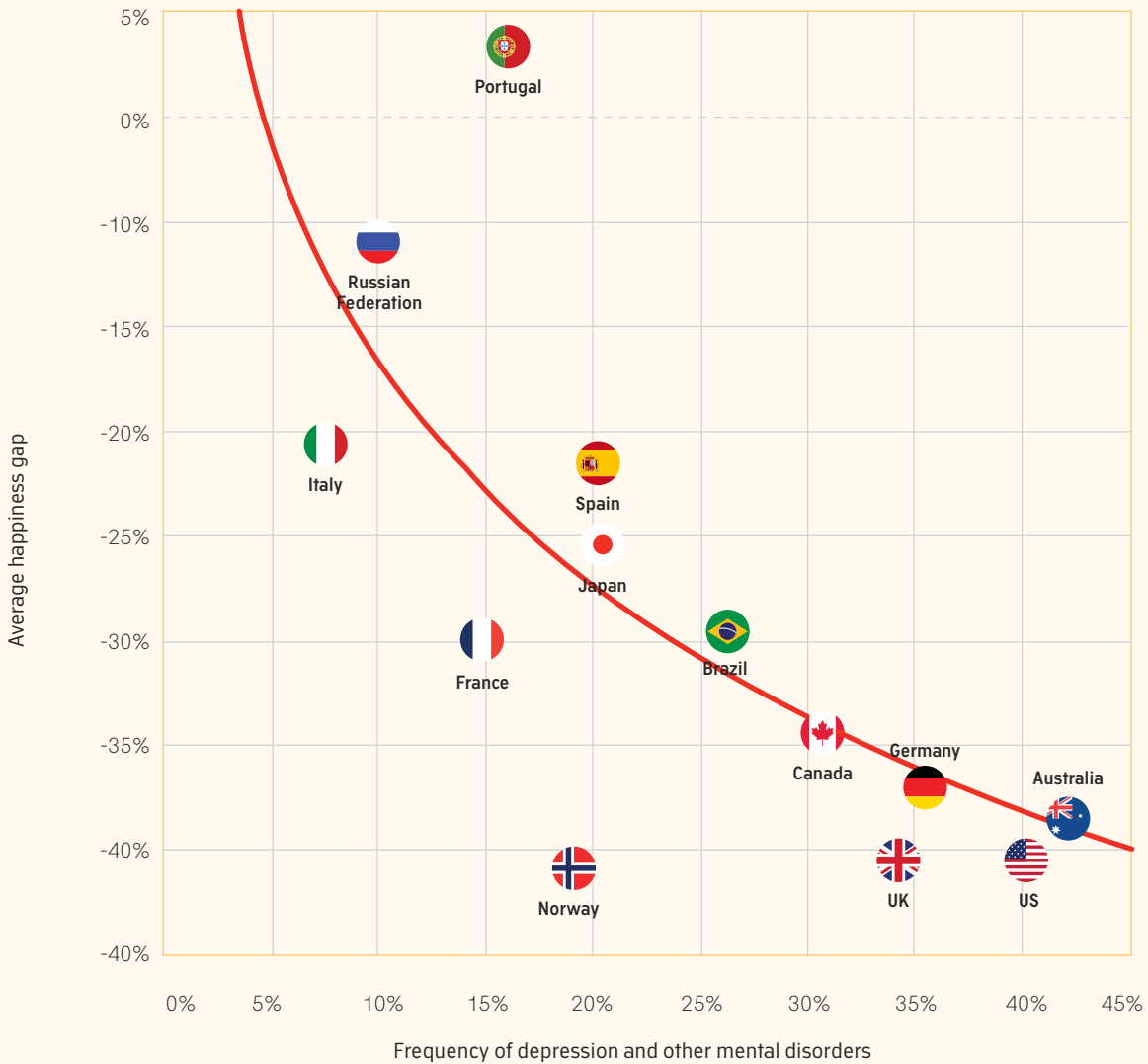
Figure 3.3: Frequency of comorbidities per gender⁸³

	Female	Male
Back pain	28.54%	21.67%
Depression or other mental disorders	28.04%	15.95%
High blood pressure	17.85%	22.87%
Joint diseases	24.20%	16.37%
Diabetes or metabolic diseases	10.40%	11.01%
Other	11.06%	7.69%
Heart and vascular diseases	5.82%	10.23%
Ulcer or stomach diseases	9.12%	6.77%
Lung diseases	5.45%	4.30%
Liver diseases	3.17%	5.72%
Abnormal bloodworks or blood diseases	3.86%	2.26%
Kidney diseases	2.51%	3.32%
Cancer	1.90%	2.47%
None of the above	26.68%	30.98%

⁸³ N=6,178



Figure 3.4: Country correlation: Frequency of depression or other mental health conditions / Happiness⁸⁴



Several considerations must be taken into account regarding the link between comorbidities and happiness. Firstly, we cannot determine the causation between happiness and comorbidities. We must assume that developing and living with additional health conditions most likely will

have a negative impact on one’s happiness, but evidence also suggests that the happiness-health causation runs both ways: illness may lead to an unhappier life, but an unhappier life may also lead to illness⁸⁵. Secondly, comorbidities correlate well with age⁸⁶ - meaning that older people struggle with

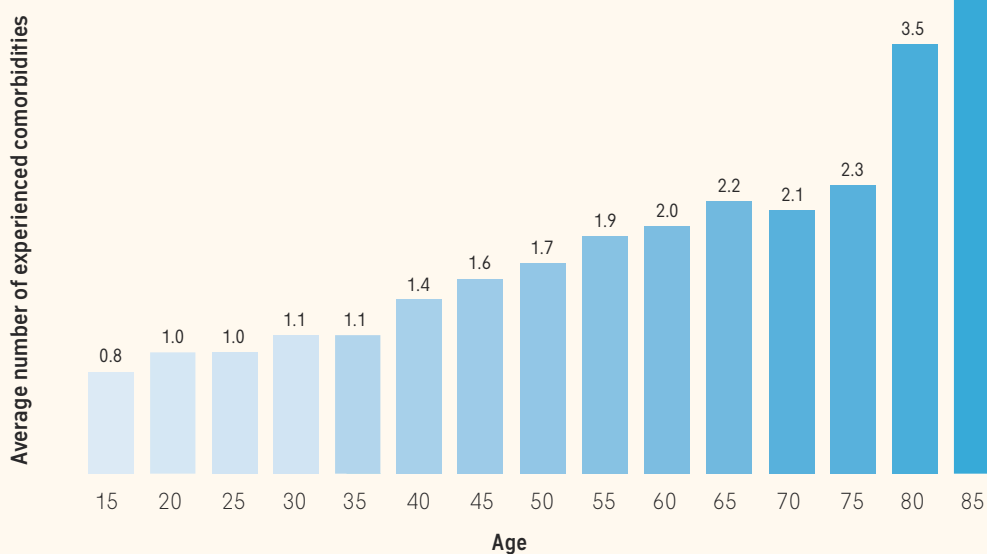
more comorbidities than younger people (See Figure 3.5 and Appendix: Table B). For instance, people below the age of 30 on average report less than one comorbidity, while people above 60 report two or more comorbidities.

⁸⁴ Pearson’s R: 0.681. Standard Error: 0.093. P-value: 0.010. N=6,244

⁸⁵ Steptoe A. & Wardle J. (2011): *Positive affect measured using ecological momentary assessment and survival in older men and women*; What Works Well-Being (2017): *Measuring Well-Being Inequalities: A How-To Guide*

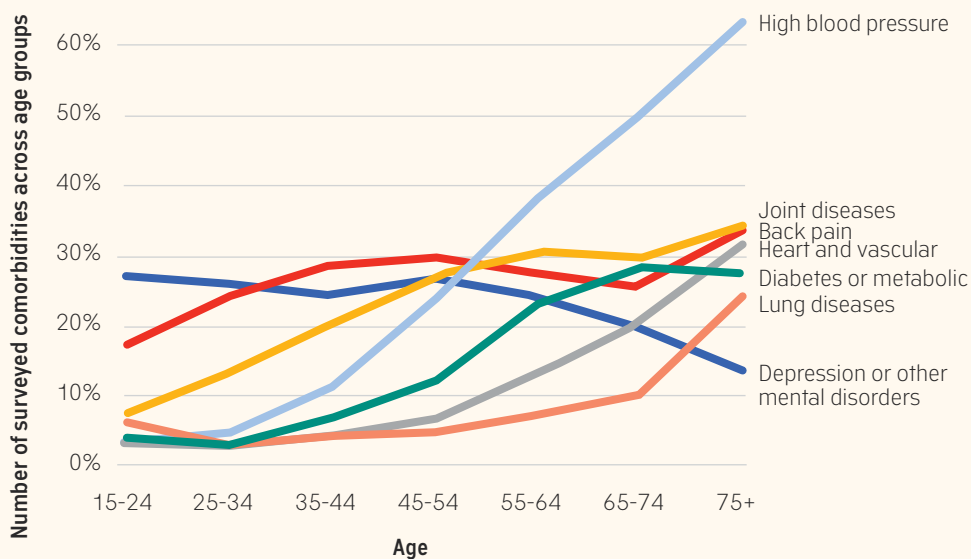
⁸⁶ See Appendix: B

Figure 3.5: Age and number of experienced comorbidities⁸⁷



Furthermore, as suggested by Figure 3.6, some comorbidities are more age-dependent than others. Lung diseases, high blood pressure, heart and vascular disease and diabetes or metabolic diseases are not very common among young people, but rapidly increase in frequency after the 35-year mark. Joint diseases and back pain seem to have a small age dependency as well, as the frequency increases from young age onwards. However, the increase is not as great as the former mentioned comorbidities; both back pain and joint diseases are already a common phenomenon in the young patient. The only comorbidity that does not increase in frequency with older age is depression and other mental disorders; these are prevalent in young people and steadily decrease with older age.

Figure 3.6: Age and comorbidities⁸⁸



⁸⁷ N=6,244

⁸⁸ N=6,215



People with bad lifestyle habits are unhappier but report fewer comorbidities

People with psoriasis have higher rates of environmental risk factors including smoking, alcohol use, obesity and sedentary lifestyles^{89,90}. These risk factors are associated with multiple comorbidities in psoriasis. However, people who report several bad lifestyle habits, though unhappier, have fewer comorbidities.

Obesity is associated with psoriasis⁹¹. Patients with psoriasis have more than 50% higher odds of obesity, which increases with disease severity^{92,93}. Obesity is closely linked to several other lifestyle diseases that are also associated with psoriasis; people

with psoriasis and a greater number of comorbidities tend to have a higher body mass index⁹⁴. Obesity or psoriasis could come first in causation; though a few studies suggest that psoriasis occurs before obesity.

Obesity is a risk factor for psoriasis. Inflammatory mediators in fat tissues may contribute to a low-grade inflammatory state in obese individuals, resulting in a range of comorbidities including cardiovascular disease, diabetes and metabolic syndrome (obesity, dyslipidemia, glucose intolerance and hypertension) and may worsen psoriasis⁹⁵. Furthermore,

having psoriasis may induce behavior changes resulting in less exercise in order to hide the skin condition, or by making poor diet choices as a result of having a more isolated lifestyle.

Having one bad habit often is associated with more bad habits⁹⁶. For instance, people who never exercise on average report 2.1 'bad habits', meaning that in addition to never exercising they may also be smoking, eating unhealthily or drinking more than 10 alcohol units per week (Figure 3.7).

⁸⁹ Lønberg, A S & Skov, L. (2017) *Comorbidity in psoriasis: Mechanisms and implications for treatment*. Expert Review of Clinical Immunology. volume 13

⁹⁰ Gisondi P, Tessari G, Conti A, Piaserico S, Schianchi S, Peserico A, Giannetti A, & Girolomoni G. (2007) *Prevalence of metabolic syndrome in patients with psoriasis: A hospital-based case-control study*. British Journal of Dermatology. July 2007. Volume 157. Issue 1, pp: 68-73

⁹¹ Jensen P & Skov L. (2017) *Psoriasis and obesity*. Dermatology 2016;232:633-639

⁹² Fleming P, Kraft J, Gulliver WP, & Lynde C. (2015) *The Relationship of Obesity With the Severity of Psoriasis: A Systematic Review*. Journal of Cutaneous Medicine and Surgery Vol 19. Issue 5.

⁹³ Armstrong AW, Harskamp CT, Armstrong EJ. (2012) *The association between psoriasis and obesity: a systematic review and meta-analysis of observational studies*.

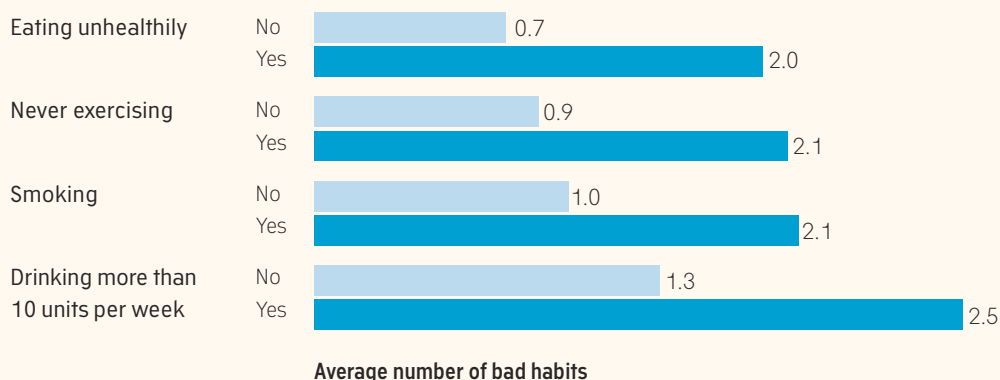
⁹⁴ Linear trend model output on respondent's BMI and their number of reported comorbidities: Pearson's R: 0.315. Standard error: 7.408. P-value: < 0.0001. n = 196

⁹⁵ Jensen P. & Skov L. (2017) *Psoriasis and obesity*. Dermatology 2016;232:633-639

⁹⁶ We have defined 'bad habits' as following: Eating unhealthily: Respondents who report 'not' to 'do you eat healthy?'. Never exercising: Respondents who report to 'never exercise'. Smoking: All respondents who report smoking (varying from 1-5 cigarettes/day to more than 15 cigarettes/day). Drinking more than 10 units per week: All respondents who report drinking at least 10-19 units per week.



Figure 3.7: Bad habits: How having one bad habit is associated to having several bad habits⁹⁷

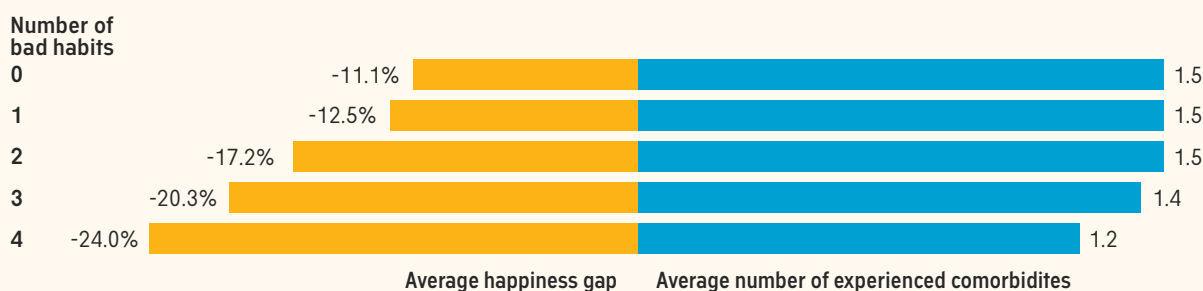


Having several bad habits is also linked to higher happiness gaps. There is a linear relationship between the number of reported bad habits and happiness gaps for people living with self-reported psoriasis (Figure 3.8), with people who report no ‘bad habits’ subject to a happiness gap of -11.1% and people who report four bad habits subject to a happiness gap of -24%.

We do not find a similar association between reporting bad habits and comorbidities. As indicated descriptively by Figure 3.8 and by our regression output⁹⁸, there is a negative association between comorbidities and lifestyle. This means that multi-disease respondents have fewer bad lifestyle habits than patients without comorbidities. This doesn’t mean that multi-disease respondents are better off.

One explanation to this observation on lifestyle and comorbidities could be that people adopt better lifestyle habits when faced with comorbid conditions, such as beginning to eat more healthily when diagnosed with diabetes, for example.

Figure 3.8: Average happiness gaps and average number of experienced comorbidities based on number of bad habits⁹⁹



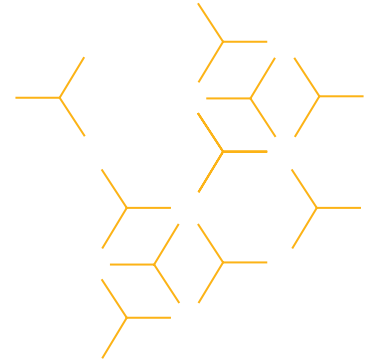
⁹⁷ N=6,170

⁹⁸ See appendix: B

⁹⁸ See appendix: B

⁹⁹ N=6,170

Good sleep patterns are strongly correlated with happiness and fewer comorbidities

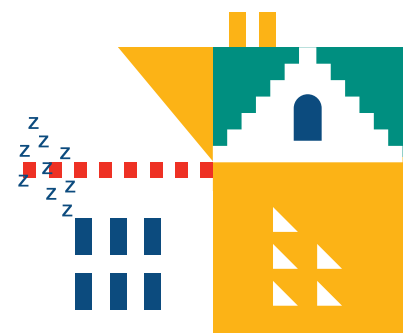
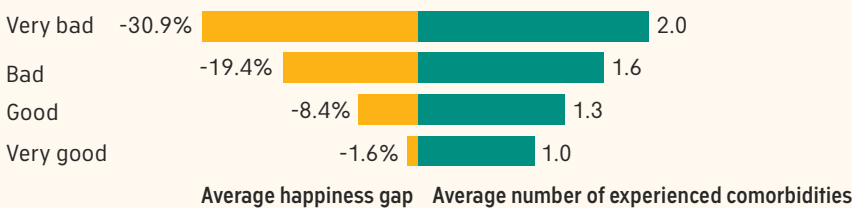


From our regression analysis we find good sleep to be a strong predictor of happiness¹⁰⁰. The happiness levels of people living with self-reported psoriasis who report to have ‘very good sleep’ do not differ much from the happiness levels of the general population. As sleep quality decreases, so do happiness levels. Comorbidities are inversely correlated with sleep quality (Figure 3.9).

Comorbidities, including metabolic syndrome and depression, are connected to psoriasis and are also associated with poor sleep quality¹⁰¹. Bad sleep patterns are a widespread issue related to comorbidities in general (Figure 3.10). Poor sleep patterns are found in 69% of people living with abnormal

bloodwork or blood diseases and 65% of people living with depression or other mental disorders. The lowest prevalence of poor sleep is amongst people living with high blood pressure (53%) and cancer (47%). For people who do not report any of the given comorbidities, the prevalence is 42%.

Figure 3.9: Sleep quality, happiness gap and amount of experienced comorbidities¹⁰²



¹⁰⁰ See Appendix: A

¹⁰¹ Gowda. S., Goldblum O.M., McCall. W.V. & Feldman. S. R. (2010) *Factors affecting sleep quality in patients with psoriasis*. Journal of The American Academy of Dermatology. July 2010. Volume 63. Issue 1. pp 114–123

¹⁰² N=6,186

Figure 3.10: Percentage of people reporting bad or vey bad sleep patterns across experienced comorbidities¹⁰³



Psoriasis and psoriatic arthritis are also associated with restless leg syndrome, which is another sleep disorder¹⁰⁴. Other comorbidities of psoriasis - such as being overweight, or having obstructive lung or heart disease - also reduces sleep quality. Mental disorders also reduce sleep quality¹⁰⁵. People with very bad sleep have an average of 2 comorbidities, while people who experience very good sleep have an average of 0.95 comorbidities (See Figure 3.9).



¹⁰³ N=6,186

¹⁰⁴ Gupta M. A; Simpson F.C & Gupta A K (2016): *Psoriasis and sleep disorders: A systematic review*. Sleep Medicine Reviews. October 2016: Volume 29. p 63-75

¹⁰⁵ Ibid.



People who never drink are unhappier and report more comorbidities

People who experience the most comorbidities as well as the largest happiness gap are the ones who never drink (Figure 3.11).

This group is subject to even bigger happiness gaps and a higher number of surveyed comorbidities than the group of people who drink 10-19 units of alcohol per week. This should of course not be interpreted as though heavy drinking is good for one's health and reduces the likelihood of developing comorbidities. Patients with psoriasis have a higher frequency of drinking, which contributes to an increased risk of cardiovascular disease and is also associated with increased risk of liver disease, depression and anxiety¹⁰⁶. However, moderate alcohol consumption in the form of beverages rich in polyphenols such as wine (especially red wine) and beer can have beneficial effects in patients with documented cardiovascular diseases¹⁰⁷.

An explanation as to why we see this link between drinking, happiness and comorbidities, is that never drinking is linked to social isolation. Of the people who never drink, 34% are considered lonely (Figure 3.12). Only the people who drink more than 20 alcohol units a week are more often lonely (35.5%). For people who drink between 1 and 19 alcohol units a week the prevalence of loneliness varies from 23% to 26.7%.

The observation that never drinking is associated with lower happiness and more comorbidities, and that it's explained through loneliness, only applies to women regardless of their employment status¹⁰⁸.

¹⁰⁶ Santos Paim de Oliveira. M., Oliveira Rocha. B. & Vieira Duarte. G (2013) *Psoriasis: Classical and Emerging Comorbidities*. Anais Brasileiros de Dermatologia. 90(1). 9-20.

¹⁰⁷ Chiva-Blanch G., Arranz S., Lamuela-Raventos RM. & Estruch R. (2013) *Effects of Wine. Alcohol and Polyphenols on Cardiovascular Disease Risk Factors: Evidences from Human Studies*. Alcohol and Alcoholism. Volume 48. Issue 3. 1 May 2013. Pages 270–277

¹⁰⁸ See Appendix: C

Figure 3.11: Alcohol consumption, happiness gap and comorbidities¹⁰⁹

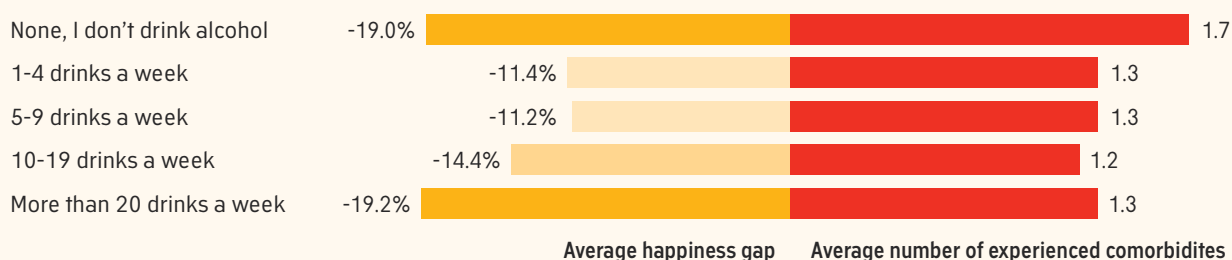


Figure 3.12: Alcohol consumption and percentage living in loneliness¹¹⁰

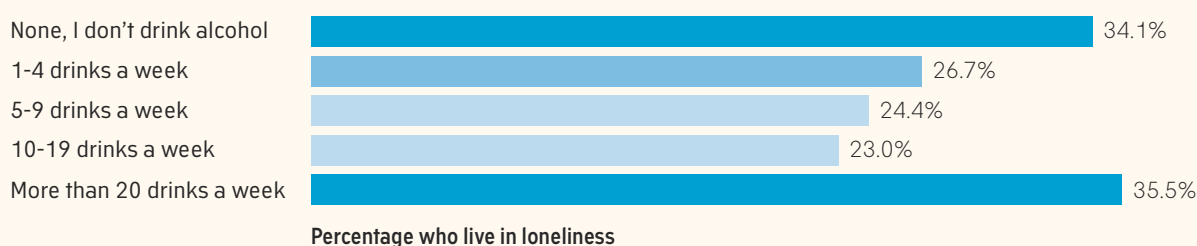
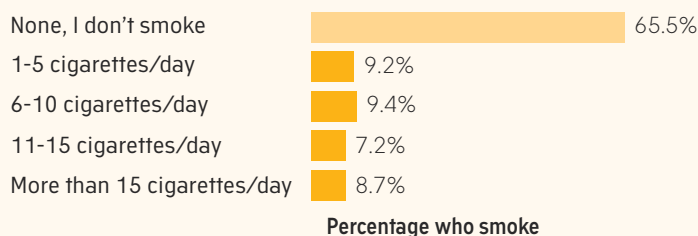


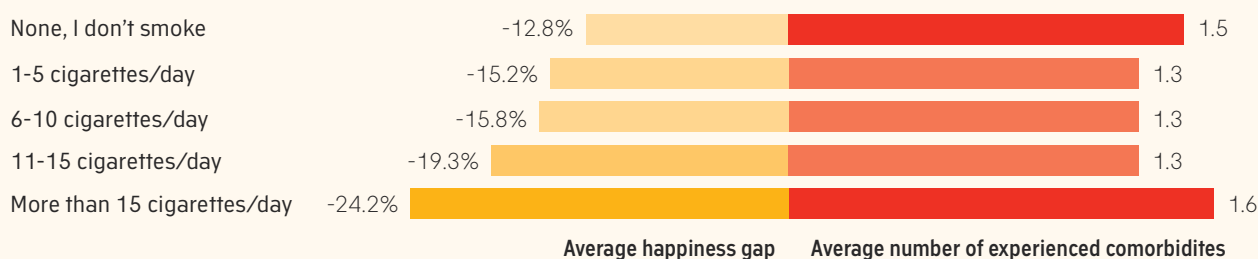
Figure 3.13: Cigarette consumption¹¹²



Besides drinking alcohol, more than one third of the self-reported psoriasis population smoke cigarettes, and smoking is linked to large happiness gaps (see Figure 3.13). In a similar trend to the link between drinking and comorbidities, never smoking is linked to having more comorbidities relative to those who smoke between 1 and 15 cigarettes. (see Figure 3.14)

Smoking is connected to not only the development of psoriasis (especially in women), but also to worsening the severity of cutaneous disease and altered response to treatment¹¹¹. This might explain the increase in unhappiness gaps and the volume of cigarette consumption.

Figure 3.14: Cigarette consumption, happiness gap and comorbidities¹¹³



¹⁰⁹ N=6,210

¹¹⁰ N=5,016

¹¹¹ Landriscina A. & Friedman A (2016): *Integrating lifestyle-focused approaches into psoriasis care: Improving patient outcomes?* Psoriasis Targets and Therapy volume 2016:6

¹¹² N=6,195

¹¹³ N=6,195

Is loneliness the greatest risk factor?

As mentioned earlier, both lifestyle factors and specific comorbidities have a negative effect on the happiness of people living with self-reported psoriasis. However, we also find that the negative effect of loneliness and stress on happiness exceeds the negative effect of both comorbidities and lifestyle. This suggests that social and mental conditions that disrupt the ability to function normally in daily life - such as stress and loneliness - are stronger predictors of overall happiness than a person's behaviour and more objective health status¹¹⁴.

Furthermore, aside from the inability to work (which is unsurprisingly strongly correlated with poor health status) loneliness is also the best predictor of the number of comorbidities that someone is likely to experience¹¹⁵. While 21.1% of people experiencing no comorbidities are lonely, that number is almost doubled (41.2%) amongst people living with 3 comorbidities (See Figure 3.15).

Again, we cannot determine the causation between loneliness and comorbidities. The correlation could suggest that socially isolated people are more likely to develop comorbidities, or that people with several comorbidities are more likely to become socially isolated.

Other studies have, however, provided evidence that social forces such as loneliness significantly affect cardiovascular health. One meta-study, for instance, showed that you are 42% more likely to die from cardiovascular disease and 55% more likely to die from a stroke if you don't have a spouse¹¹⁷. This effect could be attributed to the additional social and emotional support provided by a partner.

Another study, which followed 480,000 people over 7 years, found that people who experienced social isolation increased their risk of a heart attack by 43% and stroke by 39%¹¹⁸. This particular study also investigated whether the link between loneliness/social isolation and first time heart disease/stroke

¹¹⁴ See appendix: A

¹¹⁵ See appendix: B

¹¹⁶ N=5,030

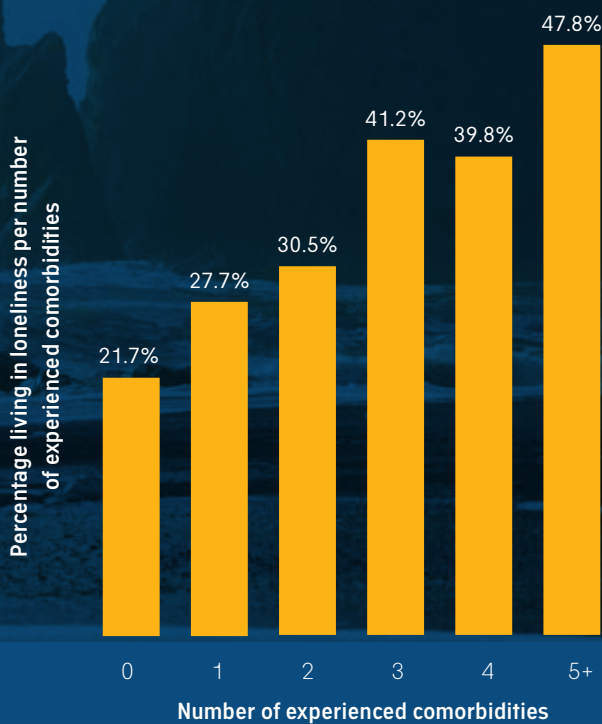
¹¹⁷ Wong CW, Kwok CS, Narain A. *et al* (2018) *Marital status and risk of cardiovascular diseases: a systematic review and meta-analysis*. Heart

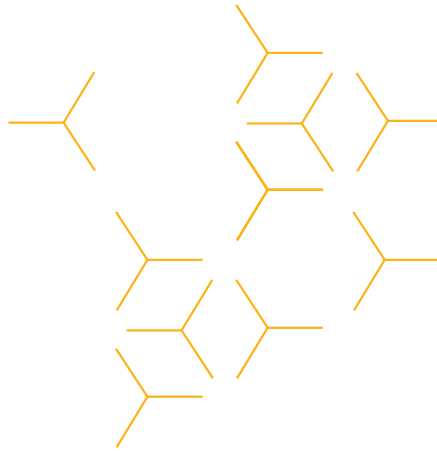
¹¹⁸ Hakulinen C, Pulkki-Råback L, Virtanen M. *et al* (2018) *Social isolation and loneliness as risk factors for myocardial infarction, stroke and mortality: UK Biobank cohort study of 479 054 men and women*. Heart

could be explained through conventional risk factors, and found that while known risk factors largely explain the link, social isolation still remains an independent risk factor for death among those with pre-existing cardiovascular disease.

Regardless of the links and causations, the main takeaway is that loneliness should be considered in relation to physical health issues, either as a risk factor, a consequence, or both.

Figure 3.15: Percentage living in loneliness per number of experienced comorbidities¹¹⁶





Emphasizing mental and social well-being in health assessments

By applying subjective well-being metrics (i.e. happiness measures) when assessing general health, it is possible to assess how people living with psoriasis experience their lives.

Subjective well-being measures are sensitive to a variety of life factors, and ensure that we do not overestimate the value of one factor over another¹¹⁹ - for instance lifestyle factors over mental health or physical symptoms over one's social engagement. In other words: subjective well-being measures don't discriminate between the importance of mental health, physical health and social well-

being when capturing how people feel about their lives. This of course is important in the development of treatment recommendations, but it's also relevant for public health policy and related discourse.

The World Health Organization (WHO) states that preventable risk factors underlie most noncommunicable diseases¹²⁰. By preventable risk factors, the WHO refers to tobacco use, physical inactivity, unhealthy diets and harmful use of alcohol (the four 'bad habits' we also have applied in this study). This study contradicts those findings somewhat by demonstrating that comorbidities are more correlated with social isolation than lifestyle factors. Moreover,

social factors also seem to moderate some of the impact of both lifestyle and comorbidities to subjective well-being. We find that never drinking alcohol is linked to lower levels of happiness for women, but it's strongly suggested that this link is caused by loneliness. The data also suggests that living with several comorbidities only affects happiness if it causes an inability to work.

The numbers presented in this study strongly suggest that it's essential to look beyond the factors measuring physical health and lifestyle, and to consider whether social conditions are directly responsible for the health and well-being of people living with psoriasis.

¹¹⁹ Dolan. P. (2011) *Using Happiness to Value Health*. Office for Health Economics. London

¹²⁰ WHO (Accessed 20th July, 2018) at: http://www.who.int/gho/ncd/risk_factors/en/





Chapter Appendix

Data analysis

These baselines are the responses that all other answers are compared to in the further analysis. So for the variables where ‘no’ is the baseline answer, the coefficient listed in the output table 3A.2 below marks the difference between respondents who answer ‘yes’ compared to that baseline. For the variable ‘occupation’, the baseline is ‘employed for wages’. In the output table 3A.2, there are several other occupation categories such as ‘retired’ and ‘student’ etc., and each of these are compared to the baseline.

Two variables have been constructed on the basis of other variables: ‘CoMorbs’ and ‘Bad Habits’.

- The “CoMorbs”-variable is based on 13 individual comorbidities that respondents were asked about. The survey asked about 4 additional comorbidities, but no respondent had any of those, so they haven’t been considered. The “CoMorbs”-variable is then an aggregate of how many comorbidities each respondent has, from 0 to 13. However, so few individuals have more than 3 comorbidities, which is why they have bundled into the category “3+”.
- The “Bad Habits”-variable is based on the 4 lifestyle habits regarding

drinking, smoking, exercising and eating healthy. We define thresholds for each habit to be good or bad, and then aggregated how many of the bad habits each respondent has.

- * For smoking, the threshold is defined as any amount above 0 cigarettes as a bad habit.
- * For drinking, the threshold is defined as anything above 10 drinks per week as a bad habit.
- * For exercise, the threshold is defined as no exercise at all being a bad habit.
- * For eating healthy, the question only had the answers “yes” and “no”, so the bad habit corresponds to the “no” answer.

The “stress” variable originally consisted of a scale from 0 – 40, and is based on the PSS-10 stress scale, for Perceived Stress Score¹²¹. In order to assess the effect stress has on happiness, it has been grouped in 3 bundles, labelled “mild”, “moderate” and “high”. The “mild” bundle goes from 0 to 13, the “moderate” bundle goes from 14 to 26 and the “high” bundle goes from 27 to 40. This particular grouping is often used, e.g. by the New Hampshire State Government [reference: <https://das.nh.gov/wellness/Docs/Perceived%20Stress%20Scale.pdf>].

Table 3A.1

Variable	Baseline
Gender	Female
Co-habitation	Lives with a partner
Occupation	Employed for wages
Psoriasis severity	Mild
UCLA Loneliness	Group 3
PSS10 Stress	Low
Sleep Quality	Bad
Comorbidity	No
CoMorbs	0
Bad Habits	0
Habit: Do you use/do...?	No
Drinking	1-4 units per week
Smoking	None. I don't smoke
Exercise	Never
Eat healthy	No

¹²¹ Cohen, S., Kamarck, T., & Mermelstein, R. (1983). *A global measure of perceived stress*. Journal of Health and Social Behavior, 24, 385-396.

A: Regression results (Cantril Ladder as dependent variable)

Variables	Individual Comorbidities	Aggregated "CoMorbs"	Without 'Unable to work'	Individual Habits
Intercept	8.06*** (0.14)	8.17*** (0.14)	8.10 (0.14)	7.93*** (0.13)
Gender baseline: Female				
Gender – Male	-0.24*** (0.07)	-0.24*** (0.07)	-0.24*** (0.07)	-0.23*** (0.07)
Co-habitation baseline: Live with a partner				
Co-habitation - Other	-0.17 (0.10)	-0.16 (0.10)	-0.10 (0.10)	-0.15 (0.10)
Co-habitation – Live alone	-0.38*** (0.06)	-0.37*** (0.06)	-0.34*** (0.06)	-0.37*** (0.06)
Occupation baseline: Employed for wages				
Occupation – Homemaker	-0.36** (0.11)	-0.36** (0.12)	-0.35** (0.11)	-0.31** (0.12)
Occupation – Student	0.29* (0.13)	0.30* (0.13)	0.27* (0.13)	0.27* (0.13)
Occupation – Other	-0.64*** (0.14)	-0.63*** (0.14)	-0.62*** (0.13)	-0.58*** (0.14)
Occupation – Unemployed. looking	-0.93*** (0.11)	-0.92*** (0.11)	-0.94*** (0.11)	-0.91*** (0.11)
Occupation – Unemployed. not looking	-1.16*** (0.21)	-1.16*** (0.21)	-1.15*** (0.21)	-1.14*** (0.21)
Occupation – Retired	-0.20* (0.10)	-0.18 (0.10)	-0.16 (0.10)	-0.16 (0.10)
Occupation – Self-employed	0.01 (0.08)	0.01 (0.08)	0.01 (0.08)	0.02 (0.08)
Occupation – Unable to work	-1.27*** (0.12)	-1.27*** (0.12)	- -	-1.21*** (0.12)

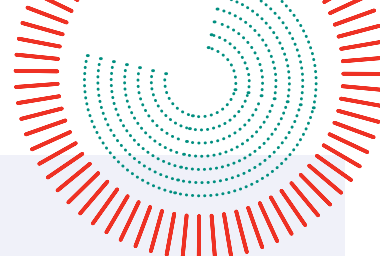
P-values: 0 '****' 0.001 '***' 0.01 '**' 0.1 '*' 0.05

Variables	Individual Comorbidities	Aggregated "CoMorbs"	Without 'Unable to work'	Individual Habits
Psoriasis severity baseline: Mild				
Psoriasis severity – Moderate	-0.24*** (0.06)	-0.25*** (0.06)	-0.22*** (0.06)	-0.22*** (0.06)
Psoriasis severity – Severe	-0.82*** (0.08)	-0.83*** (0.08)	-0.75*** (0.08)	-0.79*** (0.08)
UCLA loneliness baseline: group 3				
UCLA Loneliness – group 4	-0.21* (0.09)	-0.22* (0.09)	-0.25** (0.09)	-0.26** (0.09)
UCLA Loneliness – group 5	-0.27** (0.09)	-0.28** (0.09)	-0.30*** (0.09)	-0.30*** (0.09)
UCLA Loneliness – group 6	-0.52*** (0.09)	-0.52*** (0.09)	-0.55*** (0.09)	-0.56*** (0.09)
UCLA Loneliness – group 7	-0.51*** (0.10)	-0.53*** (0.10)	-0.54*** (0.10)	-0.54*** (0.10)
UCLA Loneliness – group 8	-0.68*** (0.11)	-0.70*** (0.11)	-0.80*** (0.11)	-0.70*** (0.11)
UCLA Loneliness – group 9	-0.99*** (0.11)	-1.03*** (0.11)	-1.06*** (0.11)	-1.04*** (0.11)
PSS10 Stress baseline: Mild				
PSS10 Stress – Moderate	-0.43*** (0.09)	-0.43*** (0.09)	-0.41*** (0.09)	-0.43*** (0.09)
PSS10 Stress – High	-1.26*** (0.11)	-1.28*** (0.11)	-1.26*** (0.11)	-1.27*** (0.11)
Sleep quality baseline: Bad				
Sleep quality – Very bad	-0.50*** (0.09)	-0.50*** (0.09)	-0.46*** (0.09)	-0.48*** (0.09)
Sleep quality – Good	0.25*** (0.06)	0.25*** (0.06)	0.23*** (0.06)	0.25*** (0.06)
Sleep quality – Very good	0.03 (0.09)	0.04 (0.09)	0.04 (0.09)	0.07 (0.09)

P-values: 0 '****' 0.001 '***' 0.01 '**' 0.1 '*' 0.05

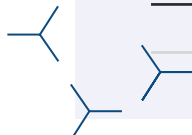


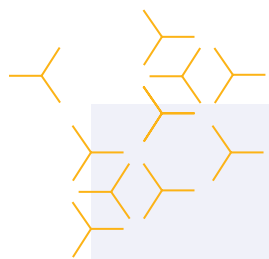
Variables	Individual Comorbidities	Aggregated "CoMorbs"	Without 'Unable to work'	Individual Habits
Comorbidity baseline (dummy variables): 0 or "no"				
Comorbidity: Blood diseases	0.20 (0.14)	- -	- -	- -
Comorbidity: Back pain	0.14* (0.06)	- -	- -	- -
Comorbidity: Cancer	0.40* (0.17)	- -	- -	- -
Comorbidity: Depression	-0.16* (0.07)	- -	- -	- -
Comorbidity: Joint diseases	-0.13 (0.07)	- -	- -	- -
Comorbidity: Liver diseases	-0.28* (0.12)	- -	- -	- -
Comorbidity: Lung diseases	0.24 (0.12)	- -	- -	- -
Comorbidity: None of the above	0.11 (0.07)	- -	- -	- -
CoMorbs baseline: 0				
CoMorbs – 1	- (0.07)	-0.08 (0.07)	-0.05 (0.07)	-0.08 (0.07)
CoMorbs – 2	- (0.08)	-0.15 (0.08)	-0.09 (0.08)	-0.14 (0.08)
CoMorbs – 3+	- (0.08)	-0.11 (0.08)	-0.24** (0.08)	-0.08 (0.08)
Bad Habits baseline: 0				
Bad habits – 1	-0.15 (0.08)	-0.17* (0.08)	-0.16 (0.08)	- -
Bad habits – 2	-0.32*** (0.08)	-0.32*** (0.08)	-0.33*** (0.08)	- -
Bad habits – 3	-0.45*** (0.10)	-0.45*** (0.10)	-0.40*** (0.11)	- -
Bad habits – 4	-0.83*** (0.20)	-0.77*** (0.20)	-0.80*** (0.20)	- -
P-values: 0 **** 0.001 *** 0.01 ** 0.1 * 0.05				



Variables	Individual Comorbidities	Aggregated "CoMorbs"	Without 'Unable to work'	Individual Habits
Habits baseline (dummy variables): 0 or "no"				
Habit: Sleep Improvement Programmes	0.60** (0.19)	0.61** (0.19)	0.70*** (0.20)	0.55** (0.19)
Habit: Swimming	-0.29** (0.10)	-0.30** (0.10)	-0.32** (0.10)	-0.29** (0.10)
Habit: Mindfulness or Meditation	0.30*** (0.07)	0.28*** (0.07)	0.24** (0.08)	0.28*** (0.07)
Habit: Go to a gym or do sports	0.21** (0.08)	0.22** (0.08)	0.24** (0.08)	0.21* (0.08)
Habit: Sunbathe when possible	0.19*** (0.05)	0.20*** (0.05)	0.23*** (0.05)	0.17** (0.05)
Habit: Get information from blogs	-0.21*** (0.06)	-0.21*** (0.06)	-0.16** (0.06)	-0.19** (0.06)
Drinking baseline: 1-4 drinks per week				
Drinking: None. I don't drink alcohol	-	-	-	-0.18** (0.06)
Drinking: 5-9 drinks per week	-	-	-	0.08 (0.09)
Drinking: 10-19 drinks per week	-	-	-	-0.07 (0.12)
Drinking: >20 drinks per week	-	-	-	-0.64*** (0.17)
Smoking baseline: None at all				
Smoking: 1-5 cigarettes per day	-	-	-	-0.05 (0.10)
Smoking: 6-10 cigarettes per day	-	-	-	-0.10 (0.09)
Smoking: 11-15 cigarettes per day	-	-	-	-0.18 (0.11)
Smoking: >15 cigarettes per day	-	-	-	-0.44*** (0.09)

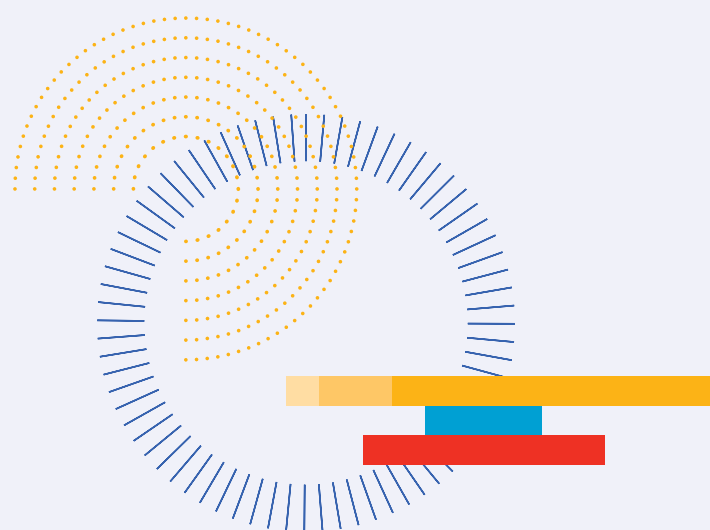
P-values: 0 '****' 0.001 '***' 0.01 '**' 0.1 '*' 0.05





Variables	Individual Comorbidities	Aggregated "CoMorbs"	Without 'Unable to work'	Individual Habits
Exercise baseline: Never				
Exercise: Once a week	-	-	-	0.24*** (0.07)
Exercise: 2-3 times per week	-	-	-	0.24** (0.08)
Exercise: Almost every day	-	-	-	0.07 (0.10)
Eat healthy baseline: no				
Eat healthy - yes	-	-	-	0.05 (0.06)

P-values: 0 **** 0.001 *** 0.01 ** 0.1 * 0.05



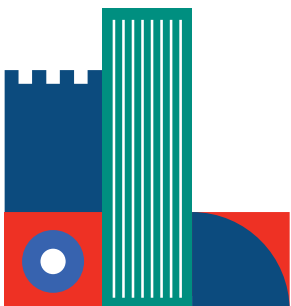
B: Regression results (no. of comorbidities¹²² as dependent variable)

Variables	Individual CoMorbs
Intercept	0.64*** (0.10)
Gender baseline: Female	
Gender – Male	-0.19*** (0.04)
Partner baseline: Married or in a relationship	
Partner - Other	0.10 (0.06)
Partner – Single	0.11** (0.04)
Age baseline: 15 to 25 years	
Age: 25-44	0.27*** (0.07)
Age: 45-64	0.76*** (0.07)
Age: 65+	1.04*** (0.09)
Psoriasis severity baseline: Mild	
Psoriasis severity – Moderate	0.10** (0.04)
Psoriasis severity – Severe	0.21*** (0.05)
P-values: 0 '***' 0.001 '**' 0.01 '*' 0.1 '**' 0.05	

¹²² The dependent variable is scaled from 0 to '3+' comorbidities.

Variables	Individual CoMorbs
UCLA Loneliness baseline: group 3	
UCLA Loneliness – group 4	0.05 (0.06)
UCLA Loneliness – group 5	0.14* (0.05)
UCLA Loneliness – group 6	0.18*** (0.05)
UCLA Loneliness – group 7	0.26*** (0.06)
UCLA Loneliness – group 8	0.30*** (0.07)
UCLA Loneliness – group 9	0.36*** (0.06)
PSS10 Stress baseline: Mild	
PSS10 Stress – Moderate	0.08 (0.05)
PSS10 Stress – High	0.24*** (0.06)
Sleep quality baseline: Bad	
Sleep quality – Very bad	0.10* (0.05)
Sleep quality – Good	-0.18*** (0.04)
Sleep quality – Very good	-0.30*** (0.06)
P-values: 0 '****' 0.001 '***' 0.01 '**' 0.1 '*' 0.05	

Variables	Individual CoMorbs
Bad habits baseline: 0	
Bad habits – 1	-0.01 (0.05)
Bad habits – 2	0.01 (0.05)
Bad habits – 3	-0.06 (0.06)
Bad habits – 4	-0.40*** (0.12)
Habits (dummy variables, i.e. baseline = 0 or “no”)	
Habit: Sleep Improvement Programmes	0.36** (0.11)
Habit: Swimming	0.09 (0.06)
Habit: Mindfulness or Meditation	0.09* (0.04)
Habit: Go to a gym or do sports	-0.19*** (0.05)
Habit: Sunbathe when possible	0.01 (0.03)
Habit: Get information from blogs	0.06 (0.03)
<hr/> P-values: 0 **** 0.001 *** 0.01 ** 0.1 * 0.05 <hr/>	



C: Women living in loneliness / alcohol consumption / employment status





Chapter 04

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Healthcare that cares

One of the main insights from last year's report was that a lack of understanding from healthcare professionals on how self-reported psoriasis affects mental health is linked to unhappiness. This chapter aims to expand on this finding, by delving into more detail on the relationship between healthcare and happiness.

The main argument is that a patient's satisfaction with their healthcare professional and their happiness are two very distinct phenomena, which are impacted by different factors. If healthcare professionals want to address the happiness issues related to psoriasis they should move their attention beyond the factors that solely promote satisfaction from the patients, and more towards actions that are linked to happiness, such as conversations on mental health and general well-being.

Main insights:

- Many people living with self-reported psoriasis experience a lack of understanding from their healthcare professional on how their disease impacts their mental health. The frequency of this lack of understanding varies between country

Country	NO. of subjects	% female	Median age
Italy	634	74.4%	42
Brazil	571	77.9%	44
Greece	549	69.2%	39
France	526	85.3%	39
Portugal	463	75.4%	40
Spain	449	78.6%	41
United Kingdom	438	77.6%	45
Germany	426	86.4%	40
Mexico	419	69.0%	41
Canada	406	87.7%	39
United States	395	87.6%	49
Denmark	275	83.3%	43

populations in accordance with the respective average happiness gaps. This suggests that the relationship between people and their healthcare professional or acknowledgement of happiness may be part of the explanation for the varying inequalities in happiness across countries.

- People who often visit their healthcare professional are more satisfied with her/him, but at the same time more unhappy about their own life in general. One suggested reason for this is that frequent visits are caused by hardships in life: unhappy people more often visit their healthcare professional, and through their visits they become more satisfied with her/him but not equivalently happy. Thus, a person's satisfaction with their healthcare cannot operate as a proxy for their general well-being.
- Several factors that affect satisfaction with a healthcare professional (such as getting clear information) do not affect happiness.
- Three factors seem to affect both patient satisfaction and happiness. These are: if the patient feels the system provides them with sufficient financial support, if the healthcare professionals fully understand the impact psoriasis has on the patient's mental well-being, and if the patient has confidence in the abilities of the healthcare professional to treat psoriasis.

Sample information:

All insights in this chapter are based on data from 12 countries out of the 21 countries included in the ranking in Chapter 1.

Included and excluded countries

The following countries have been filtered out as they didn't reach the ideal minimum sample size (n=384): Australia, Belgium, China, Colombia, Czech Republic, Ireland, Japan, Norway, Russian Federation.

The following countries have been included even though they do not reach the ideal sample size: Denmark¹²³

Disclaimers

In this chapter we encounter a very significant gender bias as female respondents account for most of the sample (between 69.2% - 87.7%). Please be aware of this bias for all descriptive outputs that are not broken down by gender. In all insights based on regression analysis we adjust for gender.

¹²³ Using a psoriasis prevalence estimate of 3.73% in Denmark, a sample size of 275 creates a margin of error of 6% with a confidence interval of 95%.



PsoHappy Profile: Marie

26 years old, Yorkshire, United Kingdom

Throughout my life, the battle with psoriasis has been a perpetual cycle. You get stressed out because of flare-ups, and after trying a new treatment that doesn't work, you get even more stressed out because your skin is not getting any better. In the past, I developed depression but I managed to get back to normal life. It's important to look out for symptoms of depression and seek out help if you need it.

Growing up with psoriasis was difficult

I've been battling psoriasis since I was quite young. My psoriasis used to be mild most of the time, but there have been times in my life when it was so severe that I wasn't able to walk or work properly. I was covered in little psoriasis patches everywhere and in my high school years, I got bullied for it a lot. When I was 21, my psoriasis symptoms became a lot worse, and it took almost two years to get a referral to the dermatologist.

When I had severe flare-ups I simply didn't want to leave the house. Psoriasis affected my self-esteem – when people were staring and making comments to me or their friends, it stressed me out and created a lot of anxiety. People would even pull away from me when I handed over change in a shop, because my hands were cracking and bleeding so much. I used to get quite angry because I knew that psoriasis was not my fault, and it wasn't something that I could control.

Don't be afraid to speak about how you feel

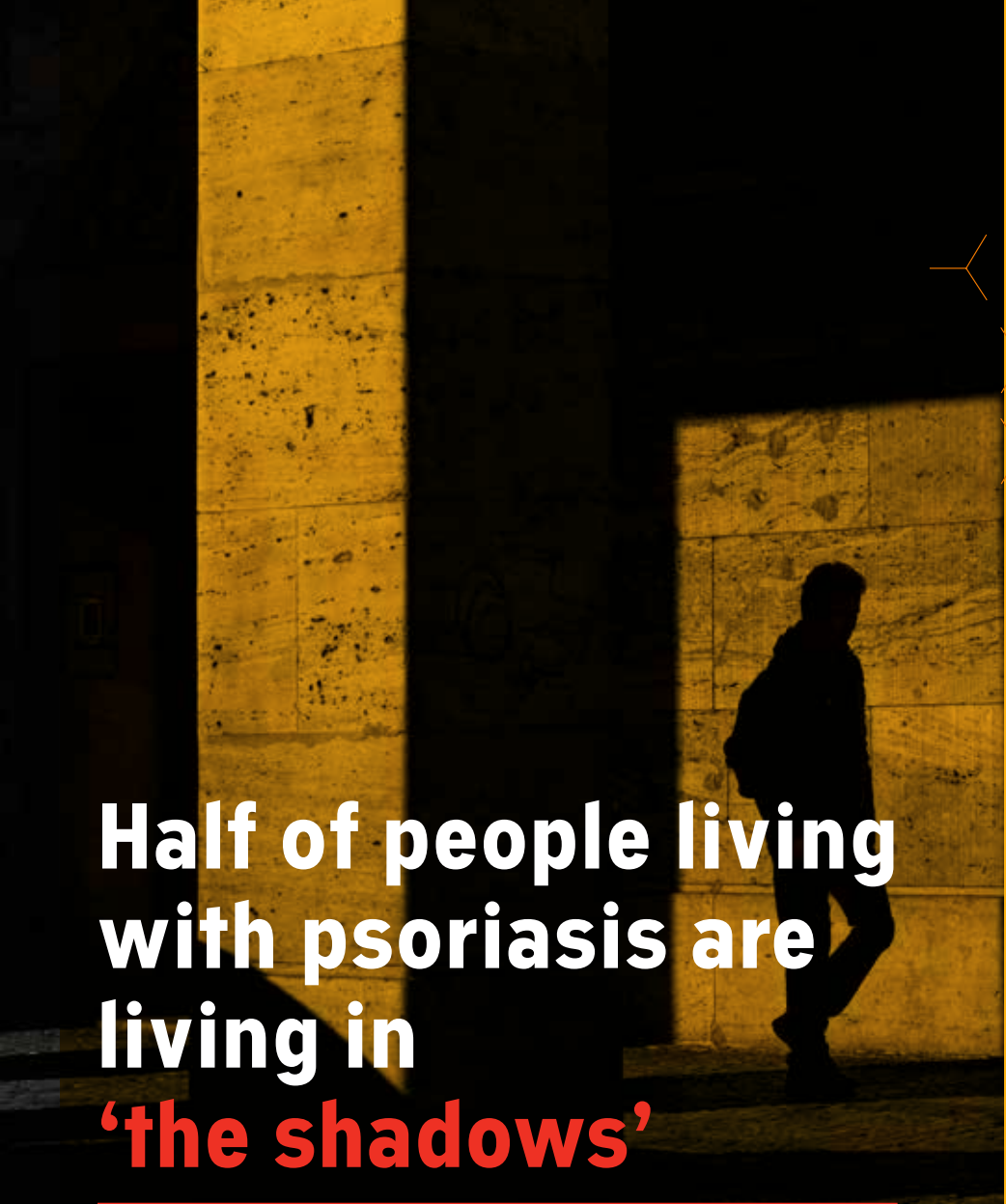
Psoriasis can definitely have an impact on personal relationships and intimacy, but it's important to be open about your condition. When I was 17 or 18 and started dating, I used to say right away, 'Look, I need you to know this – I have psoriasis and it's a chronic condition'. My current boyfriend has been very supportive and accepting. We've been together for nearly eight years, and though I have those days when my psoriasis flare-ups get really bad and I feel down, my boyfriend helps me overcome these challenges.

People's comments can hurt a lot, but I'm also aware that they don't understand what psoriasis is. I can help to change that. I try to explain to people exactly what psoriasis is, and how it affects different parts of the body. They're surprised how intricate psoriasis is – and that it is much more than just a skin condition.

Do you really know what I'm going through?

Over the years, I've met perhaps ten people living with psoriasis. None of my friends knew about psoriasis before they met me. I don't think psoriasis is that uncommon, but people aren't aware of it because it's simply not in the media. Many people with psoriasis are also not aware of psoriasis support groups and research groups.

I've never felt that doctors have really understood what I'm going through, how psoriasis makes me feel or how I'm coping with it. My mother went through much worse because she was covered with psoriasis flare-ups from head to toe. Still, she was able to teach me how to feel better about myself. She helped me a lot when I was a teenager. My skin patches used to crack and bleed regularly and it was very painful. But my mother used to tell me 'Marie, you're not a different person. You have something different, but that doesn't make you different than everybody else.'



Half of people living with psoriasis are living in 'the shadows'

In World Psoriasis Happiness Report 2017 it was highlighted how the response to the statement '*My healthcare professionals fully understand the impact psoriasis has on my mental well-being*' basically divided the population in two: 52% who agreed and 48% who disagreed. Furthermore, while agreeing with this statement was associated with an average happiness gap of -3%, disagreeing was associated with a happiness gap of -21%.

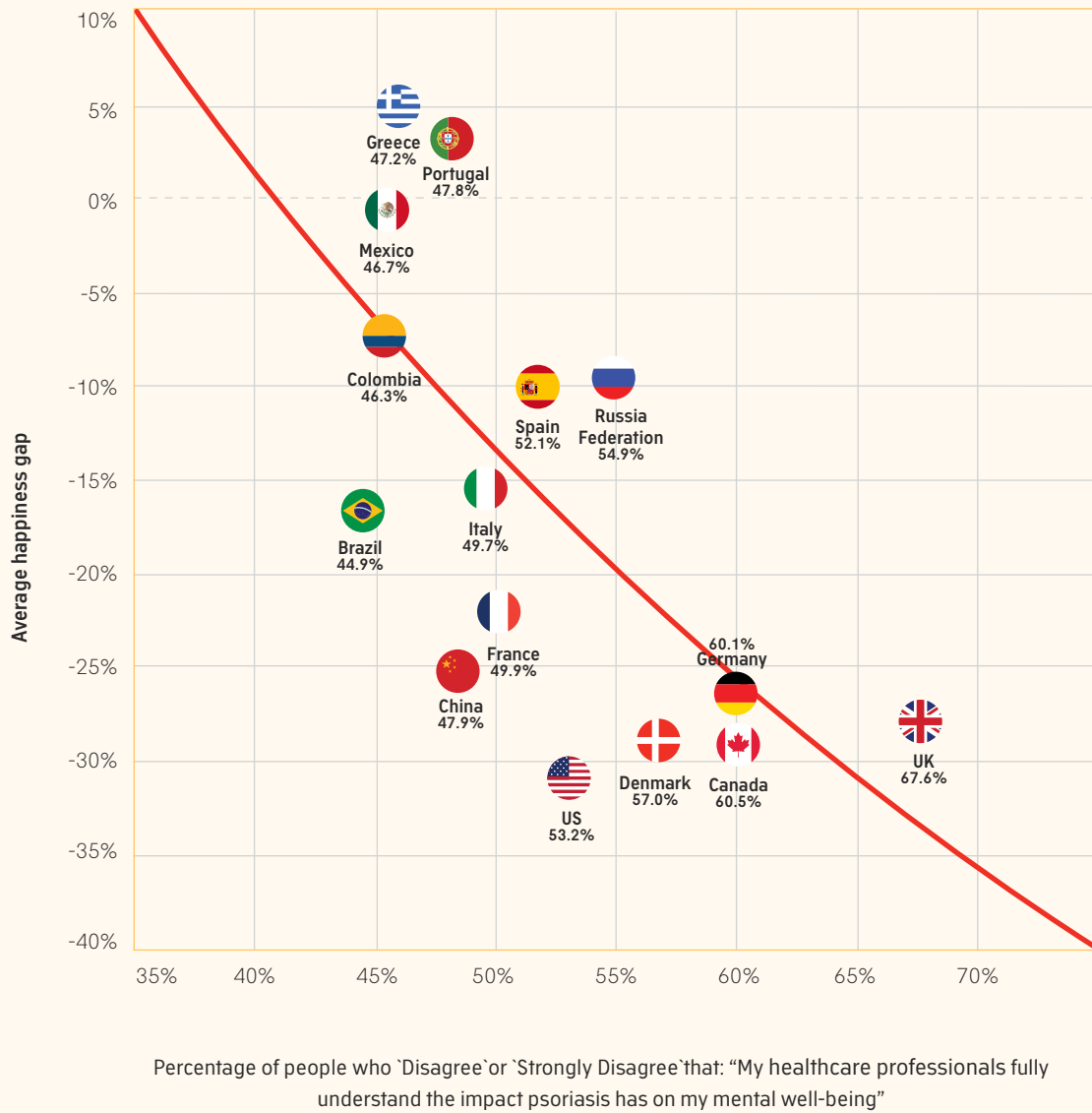
It is of course important to be aware that this descriptive analysis doesn't imply any causation. We simply cannot say whether the lack of understanding from a healthcare professional makes a person unhappy, or whether people who are unhappy tend to feel that their healthcare professional doesn't understand them. Both could also be true at the same time to some extent.

However, what the numbers show regardless of the causation is that unhappiness is widespread, and the people subject to these hardships also happen to feel a great lack of understanding about their condition from their healthcare professional. They are effectively living in 'the shadows'.

Figure 4.1 shows how the frequency of people who *do not* feel their healthcare professionals understand the impact psoriasis has on their mental health, varies a lot by country. From 44.9% in Brazil (the lowest) to 67.6% in the UK (the highest). As the trend line on the figure shows, the correlation between the frequency and the happiness gap between countries is very strong¹²⁴, meaning that the frequencies vary accordingly with the happiness gaps. This insight provides an additional possible explanation to the happiness inequalities caused by psoriasis across countries.

¹²⁴ Trend model description: R-Squared: 0.644 Standard error: 0.097 p-value (significance): 0.0095 respondents.

Figure 4.1: Country correlation: Average happiness gaps and percentage of people who 'Disagree or 'Strongly Disagree' that: 'My healthcare professionals fully understand the impact psoriasis has on my mental well-being'¹²⁵



¹²⁵ N=11,772 To include several countries, this figure is based on data retrieved since 2017.

Don't mistake patient satisfaction for happiness

In this year's report we wanted to explore the link between a person's happiness and their relationship with their healthcare professional. Based on the result mentioned in the section above (showing that happiness is linked to whether one feels that the healthcare professional understands how psoriasis impacts mental well-being) we initially assumed that general satisfaction with one's healthcare professional would be tightly connected with one's happiness.

To measure general satisfaction with healthcare professionals (referred to as 'patient satisfaction') we developed a measure in which asked people to rate how satisfied they are overall with their healthcare provider in regards to their psoriasis (on a scale of 0-10, where 0 means totally unsatisfied and 10 means totally satisfied). Interestingly, we find that healthcare professionals satisfaction and happiness are not as strongly correlated as expected¹²⁶.

In this analysis we test how different factors related to a person's interaction and engagement with their healthcare system and their healthcare professional can explain their satisfaction as well as their happiness. The fact that we did not find a strong relationship between patient satisfaction and happiness, suggests that it is different factors that impact happiness than those that affect patient satisfaction. For this reason we must distinguish between the two in this analysis.

To test the variation in patient satisfaction and happiness, we have included both a set of 'conditions' (e.g. age, gender, type of healthcare professional, stress levels) and a set of 'assessments' of the healthcare system and professionals (e.g. whether you follow the advice of your healthcare professional and whether you have confidence in their abilities). The 'conditions' and their link to happiness and patient satisfaction is listed in Table 4.1 and the 'assessments' are ranked according to their impact on happiness and patient satisfaction in Table 4.2.

¹²⁶ Trend model: Pearson's R: 0.1660. Standard error: 1.89778 p-value (significance): < 0.0001

Table 4.1: Conditions and their association to Patient Satisfaction and Happiness:

CONDITIONS	PATIENT SATISFACTION	HAPPINESS
Severity	Only people who perceive their psoriasis as severe are less satisfied with their healthcare professional than people who perceive their psoriasis to be mild. There's no difference between mild and moderate psoriasis in terms of patient satisfaction.	People who perceive their psoriasis as moderate or severe psoriasis are less happy than people who perceive their psoriasis to be mild.
Years lived with psoriasis	People who have lived with psoriasis between 1 and 5 years are less satisfied with their healthcare professional than people who have lived with psoriasis for less than a year and people who have lived with psoriasis more than 5 years.	No effect
Private/public healthcare	Compared to those who pay for their own private health insurance, people who are treated in the public healthcare system are more satisfied with their healthcare professional.	Patients who are treated by a healthcare professional that works in an institution (clinic or hospital) run as part of the public healthcare system (free for the patient) are less happy than patients who are treated by a healthcare professional working in a private institution, where patients pay for themselves.
Frequency of visits	People with psoriasis that visit their healthcare professional once a year are less satisfied than those who visit their healthcare professional 2-5 times per year or more. The least satisfied are those who never see their healthcare professional.	People living with psoriasis who visit their healthcare professional 6 to 12 times per year or more than 12 times per year are less happy than people who visit their healthcare professional once a year.
Type of HCP	People are more satisfied with their healthcare professional, when they are registered as a nurse or dermatologist, rather than a doctor / GP	Patients who are treated by a dermatologist are happier than people that are treated by a personal doctor / GP
Gender of HCP	People are more satisfied with their healthcare professional when the healthcare professional is female, or when the patient sees different healthcare professionals from one consultation to the next. Seeing the same male healthcare professional is linked to lower satisfaction. Note that these results are based on a regression analysis, so this holds true even when controlling for the gender of the patient and all the other listed variables.	No effect
Age of HCP	No effect	No effect
Stress	No effect	People living with psoriasis are less happy when they also suffer from moderate or high stress.
Loneliness	No effect	The more lonely a person living psoriasis is, the less happy that person also is.
Partner Status	No effect	People who are married or in a relationship are happier than people who register as single
Age	No effect	No effect
Gender	No effect	No effect

Table 4.2: Ranking of healthcare assessments: *healthcare specific aspects ranked according to their correlation with Patient Satisfaction and Happiness.*

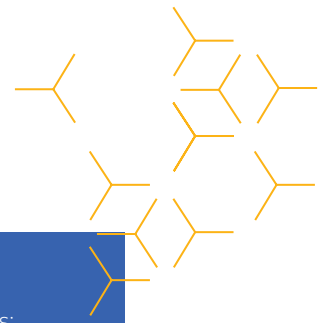
RANK	PATIENT SATISFACTION	HAPPINESS
1.	My healthcare professionals are clear with the information about how to treat psoriasis.	The system provides me with sufficient financial support in relation to my skin condition.
2.	I have confidence in the abilities of my healthcare professionals to treat psoriasis.	My healthcare professionals fully understand the impact psoriasis has on my mental well-being
3.	I've been informed about all the different treatment options related to my condition.	I have confidence in the abilities of my healthcare professionals to treat psoriasis.
4.	The system provides me with sufficient financial support in relation to my skin condition.	
5.	My healthcare professionals fully understand the impact psoriasis has on my mental well-being	
6.	I can get in touch with the healthcare professional when I'm in need.	
7.	I always follow the advice of my healthcare professionals.	

Several valuable insights emerge from the analysis behind these tables. Below we have highlighted what we find to be of most interest.

Frequent healthcare professional visits are linked to higher patient satisfaction but lower happiness

From the regression analysis we find that people who often visit their healthcare professional are more satisfied with him or her as a healthcare provider in regards to psoriasis. However, those who often visit their healthcare professional are also less happy. While this insight is provided by the regression analysis, it's also reflected descriptively as shown in Figure 4.2.



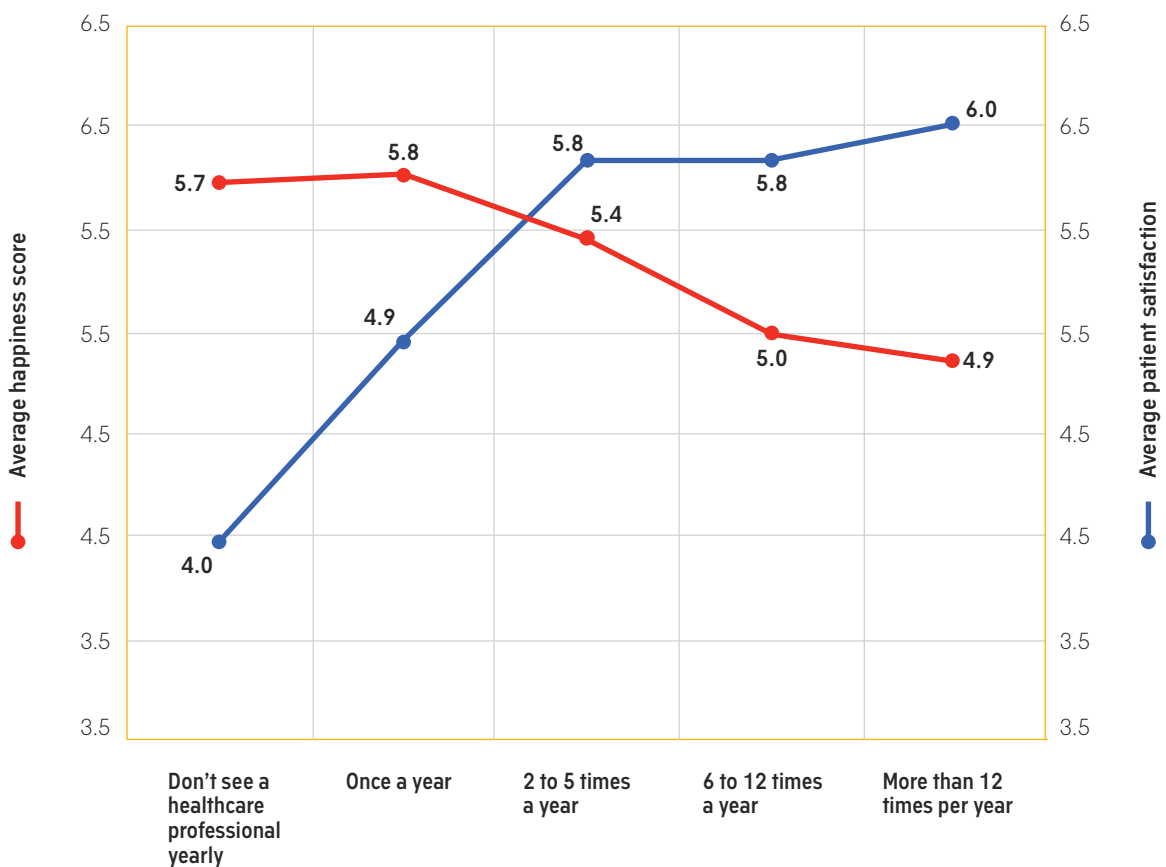


Again, as we cannot test for causality, several interpretations of these correlations present themselves. One meaningful interpretation is that patients become more satisfied with their healthcare professional because of their frequent visits, as the patient perhaps becomes more comfortable with the consultation and more personally attached to the given healthcare professional.

Simultaneously, the frequent visits are shown to be linked to lower happiness. This may seem counterintuitive, as these people are more satisfied. However, the lower happiness levels should perhaps not be seen as a consequence of the frequent visits, but instead as the underlying cause of the visits. In other words: unhappy people tend to visit their doctor more and these visits promote patient satisfaction but not happiness.

If we accept this interpretation it becomes a very valuable insight for healthcare professionals. Basically, it tells us that frequent visitors are often subject to misery. This may seem like common sense, but combined with the insights of what drives 'happiness' relative to how satisfied one is with their healthcare professional (Table 4.2), we have a case for addressing issues related to mental health and overall well-being for this group of people.

Figure 4.2: Average happiness score and average satisfaction with healthcare professional¹²⁷



¹²⁷ N=5,417



‘Clear information’ is strongly linked to satisfaction with the healthcare professional, but is not related to happiness

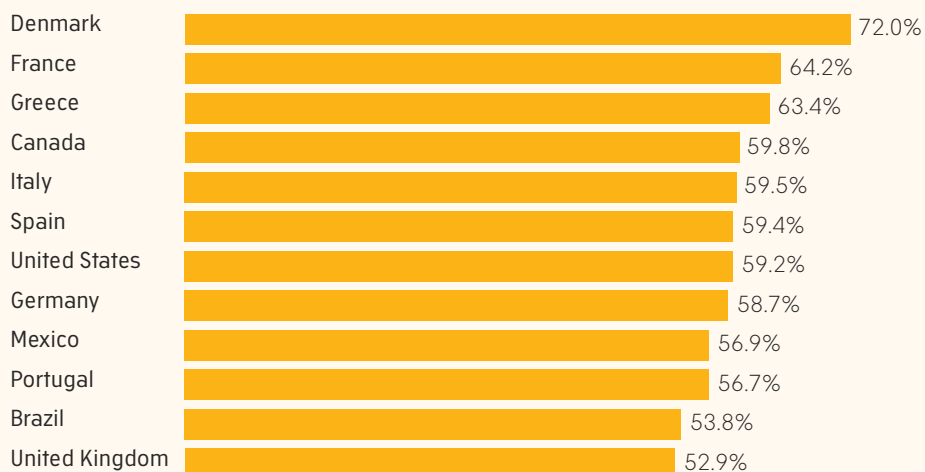
In continuation of the insight above (related to healthcare professional visits), we find that it’s of great importance to distinguish between the drivers of happiness and the drivers of patient satisfaction. A case that really demonstrates the need for this distinction is the case of the Danish population.

Table 4.2 shows how getting clear information from the doctor is the most important factor for the level of satisfaction with healthcare professionals. At the same time, this doesn’t have any impact on one’s happiness.

Furthermore, Figure 4.3 shows how the Danish population most often agrees that they receive clear information (72% of Danish people living with self-reported psoriasis), which promotes satisfaction.

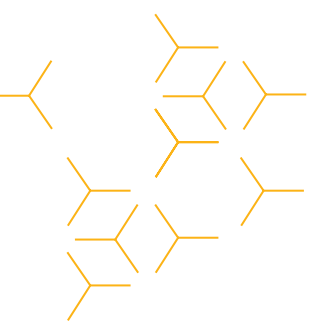
This satisfaction is, however, not converted into happiness. As we learned from Figure 4.1, 57% of people living with self-reported psoriasis in Denmark don’t experience that their healthcare professionals fully understand how psoriasis impacts their mental well-being, which in turn is linked to unhappiness.

Figure 4.3: Percentage who ‘Agree’ or ‘Strongly Agree’ that their healthcare professionals are clear with the information about how to treat psoriasis¹²⁸



Percentage who ‘Agree’ or ‘Strongly Agree’ that their healthcare professionals are clear with the information about how to treat psoriasis

¹²⁸ N=5,114



Three factors are important for both patient satisfaction and happiness

While some factors only impact patient satisfaction (such as clear information), we find three factors that promote both satisfaction and happiness for people living with self-perceived psoriasis: whether they feel that the system provides them with sufficient financial support in relation to their skin condition; whether their healthcare professionals fully understand the impact psoriasis has on their mental well-being; and whether they have confidence in the abilities of the healthcare professionals to treat psoriasis.

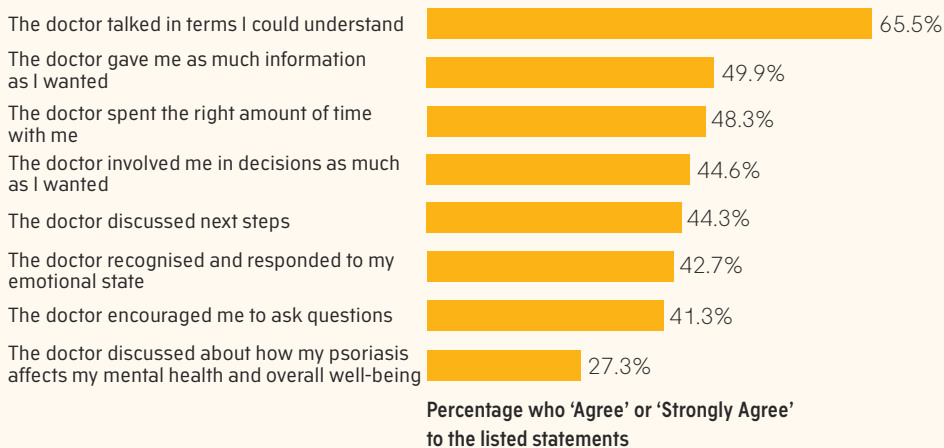
The first factor (which is also the factor that impacts happiness the most) is primarily a matter of welfare and public policy. On the other hand, ensuring that patients feel that their healthcare professionals understand how psoriasis impacts their mental well-being is something that is easy to implement

by healthcare professionals. And there may be a strong need for it.

Not only do we know that there is a lack of understanding about mental health problems from the patient’s perspective, we also know that it’s a subject that’s rarely addressed by healthcare professionals.

In this study we tested the occurrence of different events or actions taking place in the consultation. While doctors generally speak a language that people understand (65.5% agree), only 27.3% experience that their doctor discusses how psoriasis affects their mental health and general well-being (See Figure 4.4). The occurrence of such conversations also varies a lot by country, where 37.3% of Greek people report to experience it, while this is only the case for 16.5% of Canadians (See Figure 4.5).

Figure 4.4: Percentage who ‘Agree’ or ‘Strongly Agree’ to the listed statements¹²⁹



¹²⁹ N=4,238



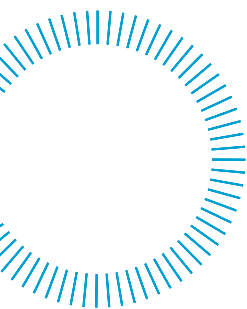
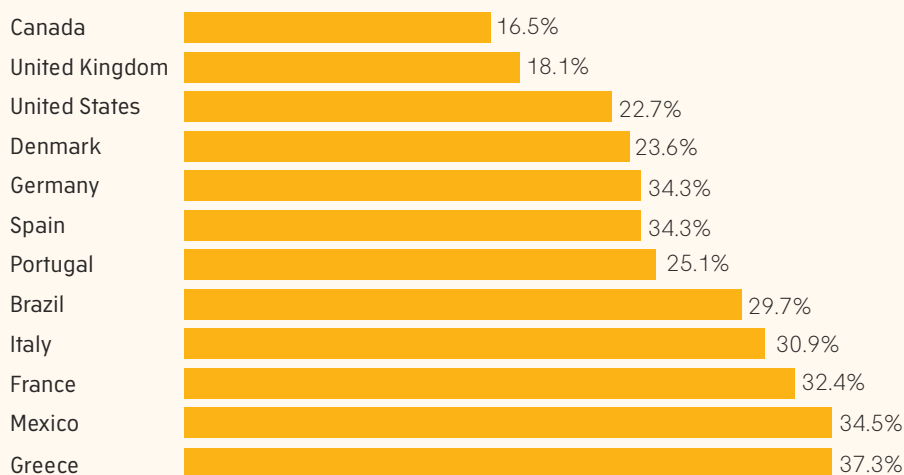


Figure 4.5: Percentage who 'Agree' or 'Strongly Agree' that their doctor discussed how psoriasis affects mental health and overall well-being, at the latest interaction¹³⁰



Percentage who 'Agree' or 'Strongly Agree' that their doctor discussed how psoriasis affects mental health and overall well-being, at their latest interaction

A healthcare that cares about what truly matters

We should not question the value of how satisfied someone is with their healthcare professional, however, patient satisfaction should never be mistaken for happiness. There are several reasons for that.

Firstly, we find that these two areas aren't strongly correlated. Secondly, the factors and conditions that seem to matter the most for patient satisfaction are not strongly linked to people's happiness, and thirdly; satisfaction is influenced by how frequently the patient attends the healthcare professional, which is an indicator of unhappiness.

Without neglecting the importance of satisfaction with the care provided and its determinants, this chapter suggests that an increased attention toward people's mental health within the patient interactions is necessary in order to address well-being issues. After all, of all the possible aspects we have tested when asking people about their recent healthcare professional interactions, doctors discussing mental health and general well-being is the least frequent action to occur.



¹³⁰ N=4,238

Chapter Appendix

In the output table below are the results from the two regressions referred to in the text.

REGRESSION RESULTS

	Model A1 Patient Satisfaction	Model A2 Cantril Ladder
Intercept	1.47*** (0.34)	7.47*** (0.18)
Gender baseline: Female		
Gender – Male	-0.04 (0.09)	0.00 (0.06)
Age		
	0.00 (0.00)	0.00 (0.00)
Partner baseline: Married or in a relationship		
Partner - 'Other'	0.07 (0.13)	-0.25** (0.09)
Partner - Single	0.01 (0.08)	-0.19*** (0.06)
Severity baseline: Mild		
Severity - Moderate	-0.44*** (0.09)	-0.53*** (0.06)
Severity - Severe	-0.55*** (0.11)	-1.29*** (0.08)
Years with Psoriasis baseline: Between 1 and 10 years		
Years with Psoriasis - Less than a year	0.42* (0.21)	-0.11 (0.15)
Years with Psoriasis - Between 5 and 10 years	0.25* (0.12)	0.08 (0.09)
Years with Psoriasis - Between 10 and 15 years	0.05 (0.12)	0.05 (0.09)
Years with Psoriasis - More than 15 years	0.29** (0.10)	0.05 (0.07)
Cantril's ladder	0.17*** (0.02)	-

REGRESSION RESULTS

	Model A1	Model A2
	Patient Satisfaction	Cantril Ladder
My HCP is baseline: My Personal Doctor / GP		
My HCP is - A dermatologist	0.58*** (0.08)	0.17** (0.06)
My HCP is - A nurse	0.72* (0.35)	0.11 (0.26)
My HCP is - Other	0.22 (0.12)	0.20* (0.09)
HCP Institution baseline: Working in a private institution that is paid out of my own pocket		
HCP Institution - Working in a private institution paid by your private health insurer	0.08 (0.11)	-0.02 (0.08)
HCP Institution - Working in an institution as part of the public healthcare sector (i.e. free)	0.31** (0.10)	-0.18** (0.07)
HCP Institution - Other	-0.11 (0.13)	-0.24* (0.10)
HCP visits per year baseline: once a year		
HCP visits per year - None	-0.40*** (0.10)	0.12 (0.07)
HCP visits per year - 2 to 5 times	0.44*** (0.09)	-0.04 (0.07)
HCP visits per year - 6 to 12 times	0.41** (0.13)	-0.25** (0.09)
HCP visits per year - More than 12 times	0.55** (0.20)	-0.70*** (0.15)
HCP Gender baseline: Female		
HCP Gender - Irregular doctors	-0.29* (0.13)	-
HCP Gender - Male	-0.19* (0.08)	-

REGRESSION RESULTS

	Model A1 HCP Satisfaction	Model A2 Cantril Ladder
Age baseline: Between 20 and 30 years old		
HCP Age - Between 30 and 40 years old	-0.04 (0.23)	-
HCP Age - Between 40 and 50 years old	0.01 (0.23)	-
HCP Age - Between 50 and 60 years old	0.03 (0.23)	-
HCP Age - Older than 60 years old	-0.01 (0.27)	-
HCP Age - Don't know	-0.05 (0.31)	-
HCP Age - Irregular doctors	0.23 (0.26)	-
HCP Consultation Topics baseline (dummy variables): 0 or 'no'		
HCP Consultation Topic: I always follow the advice of my HCPs	0.34*** (0.09)	-0.06 (0.06)
HCP Consultation Topic: I can get in touch with my HCP when I'm in need	0.45*** (0.08)	0.01 (0.06)
HCP Consultation Topic: I have confidence in the abilities of my HCP to treat psoriasis	0.90*** (0.09)	0.13* (0.06)
HCP Consultation Topic: I've been informed about all the different treatment options	0.66*** (0.09)	-0.02 (0.06)
HCP Consultation Topic: My HCPs are clear with the information about how to treat psoriasis	1.18*** (0.09)	0.02 (0.07)



REGRESSION RESULTS

	Model A1 HCP Satisfaction	Model A2 Cantril Ladder
HCP Consultation Topic: My HCPs full understand the impact psoriasis has on my mental well-being	0.60*** (0.09)	0.14* (0.07)
HCP Consultation Topic: The system provides me with sufficient financial support in relation to my skin condition	0.64*** (0.08)	0.15* (0.06)
PSS10 Stress baseline: Low		
PSS10 Stress - Moderate	-0.16 (0.13)	-0.76*** (0.10)
PSS10 Stress - High	-0.07 (0.15)	-1.55*** (0.11)
UCLA Loneliness baseline: group 3		
UCLA Loneliness - group 4	-0.01 (0.12)	-0.30*** (0.09)
UCLA Loneliness - group 5	0.04 (0.12)	-0.43*** (0.09)
UCLA Loneliness - group 6	0.04 (0.11)	-0.63*** (0.08)
UCLA Loneliness - group 7	-0.01 (0.13)	-0.96*** (0.10)
UCLA Loneliness - group 8	0.18 (0.15)	-0.89*** (0.11)
UCLA Loneliness - group 9	0.14 (0.14)	-1.40*** (0.10)
P-values: 0 '***' 0.001 '***' 0.01 '***' 0.1 '**' 0.05		

Concluding remarks: a better life for people living with psoriasis

Now in its second year, the World Psoriasis Happiness Report aims to explore the impact psoriasis has on happiness. The goal is to highlight priority focus areas that support the design of effective healthcare policies and pathways to help people improve their lives.

As this report details, even when comorbidities are present, social and mental well-being aspects like stress, loneliness and poor mental health are more strongly linked to overall levels of happiness for people living with self-reported psoriasis. This suggests that interventions that are focused on decreasing loneliness or managing stress and poor mental health should be a priority and requires efforts from both government bodies, organization and healthcare systems and professionals.

Direct investments in mental health seem to be an obvious route, as such interventions hold the potential to lift a large number of people out of misery, without imposing great costs on society. In fact, the net costs may even be negative.

Adopting a more coordinated approach that aims to jointly mitigate health issues and

general well-being problems, also seems to be an obvious part of the solution. We believe that achieving progress in these areas starts by incorporating mental and social well-being in the global health agendas to a greater extent.

Furthermore, this approach would put patients at the centre of the system the right way: by caring about their lives and happiness, not just their illness and treatments. According to the data insights, there are yet many happiness benefits to reap, simply by addressing relevant aspects of general well-being in the psoriasis consultations and treatment plans.

At the same time, any insights on how to change people's lives for the better should ultimately be put into practice. Therefore, the World Psoriasis Happiness Report advocates for wide cooperation among government bodies, payers, healthcare professionals, patient groups and pharma companies. Adopting a unified approach to measuring the well-being of people living with psoriasis would facilitate a greater ideas exchange, collaboration around key initiatives and, ultimately, and would support better lives, health and healthcare systems.



Future plans: putting happiness on the global healthcare agenda

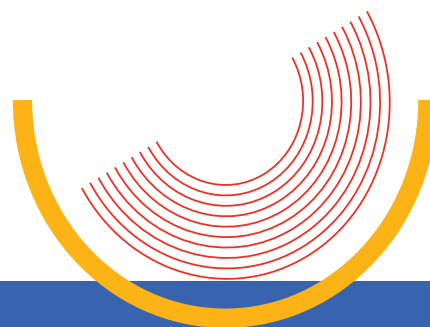
Happiness provides important new perspectives on social progress and inequality so it's becoming a critical issue for leaders in government, business and civil society. We believe that policy makers should focus their efforts to understand the underlying factors that lead to gaps in happiness, and develop actions that could bridge these gaps. On this basis, applying happiness methodologies and approaches in health is an area that deserves particular consideration.

A special momentum was created in May 2018, when the data from the World Psoriasis Happiness Report 2017 was featured at the WHO Side Event organized by IFPA and the NCD Alliance under the theme '*Happiness and NCDs: Mind the Gap*'. The Global Health Council published an article covering the event and the key insights discussed. We will continue to work with organisations, key opinion leaders and patient advocates to advance the agenda of happiness for people living with chronic conditions, with focus on mental and social well-being.

The work underlying the World Psoriasis Happiness report is ongoing. We are on a continued mission to improve our knowledge about happiness and psoriasis, but we are also planning to cover several other chronic conditions in the future.

Using happiness as a metric, it's easier to build a 'common currency' across chronic conditions, and the global data we deliver speaks volumes to policy makers and those leading happiness agendas at institutions from the UN to the WHO and OECD. Our flexible and agile technology collects data from around the globe, fast - and enables a unified analysis of insights across countries.

Ultimately, we aim to help healthcare systems and healthcare professionals to develop more patient-oriented practices and governments to better prioritise health policies and interventions.



References

- **Armstrong AW, Harskamp CT, Armstrong EJ. (2012)** The association between psoriasis and obesity: a systematic review and meta-analysis of observational studies.
- **Brezinski, E A., Dhillon, J S. & Armstrong, A W. (2015)** Economic Burden of Psoriasis in the United States A Systematic Review, *JAMA Dermatol* Volume 151, Number 6
- **Cantril, H. (1965).** The pattern of human concerns. New Brunswick, NJ: Rutgers University Press.
- **Chisholm, D., Sweeny, K., Sheehan, p., Rasmussen, B., Smit, F., Cuijpers, P. & Saxena, S. (2017):** Scaling-up treatment of depression and anxiety: a global return on investment analysis, World Health Organization
- **Chiva-Blanch G., Arranz S., Lamuela-Raventos RM. & Estruch R. (2013)** Effects of Wine. Alcohol and Polyphenols on Cardiovascular Disease Risk Factors: Evidences from Human Studies. *Alcohol and Alcoholism*. Volume 48. Issue 3. 1 May 2013. Pages 270–277
- **Cochran, W. G. (1963).** Sampling Techniques, 2nd Ed., New York: John Wiley and Sons, Inc.
- **Cohen, S., Kamarck, T., & Mermelstein, R. (1983).** A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.
- **Den Nationale Sundhedsprofil 2017 (Accessed 5th July 2018)** via: <http://www.danskernessundhed.dk/>
- **Dolan, P. & Kahneman, D. (2008)** Interpretations of utility and their implications for the valuation of health. *Economic Journal*. 118(525), 215-234
- **Dolan, P. (2011)** Using Happiness to Value Health, Office for Health Economics, London
- **Fleming P., Kraft J., Gulliver WP. & Lynde C. (2015)** The Relationship of Obesity With the Severity of Psoriasis: A Systematic Review. *Journal of Cutaneous Medicine and Surgery* Vol 19. Issue 5.
- **Gisondi P., Tessari G., Conti A., Piaserico S., Schianchi S., Peserico A., Giannetti A. & Girolomoni G. (2007)** Prevalence of metabolic syndrome in patients with psoriasis: A hospital-based case-control study, *British Journal of Dermatology*. July 2007. Volume 157. Issue 1. pp: 68-73
- **Gowda. S., Goldblum O.M., McCall. W.V. & Feldman. S. R. (2010)** Factors affecting sleep quality in patients with psoriasis. *Journal of The American Academy of Dermatology*. July 2010. Volume 63. Issue 1. pp 114–123
- **Gupta M. A; Simpson F.C & Gupta A K (2016):** Psoriasis and sleep disorders: A systematic review. *Sleep Medicine Reviews*. October 2016: Volume 29. p 63-75
- **Hakulinen C. Pulkki-Råback L. Virtanen M. et al (2018)** Social isolation and loneliness as risk factors for myocardial infarction. stroke and mortality: UK Biobank cohort study of 479 054 men and women. *Heart*
- **Helliwell, J., Layard, R. & Sachs, J. (2018).** World Happiness Report 2018, New York: Sustainable Development Solutions Network.
- **Helliwell, J., Layard, R., & Sachs, J. (2017).** World Happiness Report 2017, New York: Sustainable Development Solutions Network.
- **Helliwell, J.F. & Huang, H. (2011)** New Measures of the Costs of Unemployment:



- Evidence from the Subjective Well-Being of 2.3 Million Americans, *Economic Inquiry*.
- **Hughes, M. E., Waite, L. J., Hawkey, L. C., & Cacioppo, J. T. (2004).** A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, 26, 655-672.
 - **Hurst, N.P., Jobanputra, M., Hunter, M., Lambert, M., Lockhead, A. & Brown, H. (1994)** Validity of EuroQoL—a generic health status instrument—in patients with rheumatoid arthritis. *Rheumatology*, 33(7), 655–662.
 - **Jensen P. & Skov L. (2017)** Psoriasis and obesity. *Dermatology* 2016;232:633-639
 - **Landriscina A. & Friedman A (2016):** Integrating lifestyle-focused approaches into psoriasis care: Improving patient outcomes? *Psoriasis Targets and Therapy* volume 2016:6
 - **Layard, R. (2018)** Mental Illness Destroys Happiness And Is Costless To Treat, in *Global Happiness Policy Report (2018)*, World Government Summit, United Arab Emirates.
 - **Lebwohl, M.G., Bachelez, H., Barker, J., Girolomoni, G., Kavanaugh, A., Langley, R.G., Paul, C.F., Puig, L., Reich, K., van de Kerkhof, P.C. (2014)** Patient perspectives in the management of psoriasis: results from the population-based Multinational Assessment of Psoriasis and Psoriatic Arthritis Survey. *J Am Acad Dermatol.* 2014; 70: 871–881
 - **Lonberg, A S & Skov, L. (2017)** Comorbidity in psoriasis: Mechanisms and implications for treatment. *Expert Review of Clinical Immunology*. volume 13
 - **Neun, S.P. and Santerre, R.E. (2007):** *Health Economics: Theories, Insights, and Industry Studies*. 4th Ed. Mason: Thomson South-Western
 - **OECD (2013):** *Guidelines On Measuring Subjective Well-being*, Paris: OECD Publishing.
 - **Oswald, A., Proto, E., & Sgroi, D. (2014).** Happiness and Productivity. *Journal of Labor Economics*, 33(4), 789–822.
 - **Rath, T., & Harter, J. (2010):** *The Economics of Well-being*, Gallup Consulting.
 - **Russell, D. W. (1996).** UCLA Loneliness Scale (version 3): Reliability, validity and factor structure. *Journal of Personality Assessment*, 66, 20-40.
 - **Santos Paim de Oliveira. M., Oliveira Rocha. B. & Vieira Duarte. G (2013)** Psoriasis: Classical and Emerging Comorbidities. *Anais Brasileiros de Dermatologia*. 90(1). 9-20.
 - **Stephoe A. & Wardle J. (2011):** Positive affect measured using ecological momentary assessment and survival in older men and women; *What Works Well-Being (2017): Measuring Well-Being Inequalities: A How-To Guide*
 - **Stiglitz, J. E., Sen, A. & Fitoussi, J. P. (2009)** Report by the Commission on the Measurement of Economic Performance and Social Progress, Paris.
 - **Whillans A V, Weidman A C, & Dunn E W. (2016)** Valuing Time Over Money Is Associated With Greater Happiness, *Social Psychological and Personality Science*, Vol 7, Issue 3, pp. 213 - 222
 - **WHO (Accessed 20th July 2018)** at: http://www.who.int/gho/ncd/risk_factors/en/
 - **Wesselink, B., Bakkes, J., Best, A., Hinterberger, F., ten Brink, P. (2007),** *Measurement Beyond GDP*, paper presented at *Beyond GDP: Measuring progress, true wealth, and the well-being of nations*, November 2007, Brussels.
 - **Wong CW, Kwok CS, Narain A. et al (2018)** Marital status and risk of cardiovascular diseases: a systematic review and meta-analysis. *Heart*

