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An investigation into prescriptions and medication availability for psoriasis patients in Chile, Colombia, and Germany

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List of Abbreviation

BSA	Body Surface Area
CI	Confidence Interval
CTP	Capacity To Pay
CVderm	Competence Center of Care Research in Dermatology
DQLI	Dermatology Quality of Life Index
EPS	Entidades Promotoras de Salud (Health provider in Colombia)
EU	Europe
FONASA	Fondo National de Salud (Health provider in Chile)
GDP	Gross Domestic Product
GPA	Global Psoriasis Atlas
HRQOL	Health-related Quality of life
IFPA	International Federation of Psoriasis Associations
ILDS	International League of Dermatological Societies
IPA	International Psoriasis Council
ISAPRE	Institucines de Salud Provisional (Health provider in Chile)
IVDP	Institute for Health Services Research in Dermatology and Nursing
OR	Odds Ratio
P	P-value
PASI	Psoriasis Area and Severity Index
PHI	Private Health Insurance
PsA	Psoriatic Arthritis
PsoBest	Das Deutsche Psoriasis-Register (German psoriasis registry)
SDGs	Sustainable Development Goals
SHI	Statutory Health Insurance
SPSS	Statistical Package for the Social Sciences
UHC	Universal Health Coverage
UKE	Universitätklinikum Hamburg-Eppendorf (University Medical Center Hamburg-Eppendorf)
US	United States
USD	United States Dollars
VIF	Variance inflation factor
WHO	World Health Organization

Abstract:

Background: Psoriasis is a chronic, immunological, and systemic skin, with an estimated 60 million people worldwide affected. It is associated with Joints and nails involvement as well as several comorbidities. There are several treatment options available for psoriasis, including systemic and biologic medications for moderate to severe psoriasis; access to efficient care is not equal around the globe. This thesis's overall objective was to investigate prescriptions and medication availability for psoriasis patients in Chile, Colombia, and Germany.

Methodology: This is a cross-sectional study that utilized the existing database from the Institute for Health Services Research in Dermatology and Nursing (IVDP), UKE, Hamburg. The data was collected between 2015 to 2020 from three questionnaire-based surveys in Chile, Colombia, and Germany. The Total sample included 916 psoriasis patients above 18 years old. The Chi-Square tests were used to assess the association between age, gender, country, and prescriptions as well between severity indices categories and country (p-value<0.05). The nonparametric test examined the severity scores and prescriptions. Binary logistic regression analyses were carried out to identify the contributing predictors in medication prescriptions of each country.

Results: Medications for psoriasis treatment were available in Germany more than Chile and Colombia. In total, the most common medication's prescription was adalimumab and methotrexate. Prescription of biologic and non-biologic medications was significantly associated country (biologics: X2 (2, N=916) =57.6, p<0.001, non-biologics X2 (2, N=916) =25.16, p<0.001). Psoriasis area and severity index (PASI) and Dermatology Life Quality Index (DLQI) were also significantly associated with country respectively X2(6,N=852)=206.3, p<0.001, X2(8,N=671)= 160.03, p<0.001). PASI and DLQI were significantly higher among Chilean patients. The current prescription of non-biologic was decreased by having a previous non-biologic prescription in Chile and Colombia. However, in Germany, previous biologic decreased the chance of receiving a non-biologic by 75% (OR=0.243, CI:0.101-0.587, p=0.002). The current biologic prescription was affected by more factors in Chile; DLQI, PASI, previous medications were significant. Among all, the odds of being prescribed a biologic is 63 times more when having a previous non-biologic

prescription in Chile (OR= 63.57, CI= 4.99-810.62, p=0.001). In Colombia, previous biologic prescription and DLQI were the significant factors. The previous non-biologic prescription will increase the odds by 8.2 times for having a biologic prescription (OR= 8.254, CI=2.615-26.051, p<0.001). The assumption of linearity of the logits for binary logistic regression has been violated for Germany. However, the model was significant (R^2= 0.220 (Cox–Snell), 0.313 (Nagelkerke). Model X2(2) =118.339, p < 0.001).

Conclusion: In comparison with Germany, shortcomings were existing for available medications in Chile and Colombia. The prescription of non-biologic was higher in Germany however, it was close to the biologic prescription's percentages. Although, reimbursement was not possible in Chile, percentage of prescriptions for biologic was higher than other countries. In Colombia and Germany, biologic prescription was almost similar as well as PASI and DLQI median values. The results of binary logistic regression showed that PASI and DLQI indices were not necessarily directly affected the prescription. Previous medications have shown also, impact new prescriptions. Further research is needed with controlling more factors to assess these relationships.

1. Introduction

After reviewing the report on the disease burden of psoriasis from 2013, the Executive Board of World Health Organization (WHO) suggested that the 67th World Health Assembly called for a plan to raise awareness about psoriasis as a major global health problem (Boehncke & Schön, 2015). Psoriasis is an inflammatory skin disease, usually accompanied by extreme scaling. Beside its physical burden, it can also affect the patients' quality of life (Chong, Kopecki, & Cowin, 2013; Reich, 2012). Prevalence of psoriasis is fluctuating worldwide from 0.14% (95% uncertainty interval 0.05% to 0.40%) in East Asia to 1.99% (0.64% to 6.60%) in Australasia (Parisi et al., 2020). The psoriasis' prevalence is also high in Western Europe and high income southern Latin American countries. Germany, with an average of 1.5 million patients (prevalence between 1.12% to 4.38%), is one of the countries with the largest number of psoriasis patients, while in Chile and Colombia the prevalence diagnosed by physicians and dermatologists is approximately 1 to 2% of the adult population (Parisi et al., 2020).

Although no specified cure is yet available for psoriasis, symptoms can be controlled with some medications. Treatment for psoriasis is complicated and depends on many individual factors to ensure the effectiveness of treatment (Augustin et al., 2014). In addition to that, there is contradicting evidence worldwide on the psoriasis treatment, indicating factors such as education or socioeconomic status affecting the treatment (Naldi et al., 2017). Biologic therapies have a crucial role in management of the disease; however, access to these therapies varies in different parts of the world. Factors, such as insufficient health insurance coverage and the disproportionately high price of these drugs, contributed to limitation in access to biologics (Carrascosa, Jacobs, Petersel, & Strohal, 2018).

Equality in access to safe, affordable, and effective medicine for all needs to be taken into consideration as part of fulfilling sustainable development goals (SDGs) by the United Nations regarding good health and well-being for all. To make sure this aim is achievable; the first step is to investigate the current situation carefully. Global Psoriasis Atlas (GPA) is a long term project that aims to provide a better understanding of psoriasis. It delivers the real-world epidemiological data on psoriasis as well as investigating access to treatment, psoriasis comorbidities, and the related costs of psoriasis worldwide. GPA is a collaboration of three international dermatology organizations, the International Federation of Psoriasis

Associations (IFPA), the International League of Dermatological Societies (ILDS), and the International Psoriasis Council (IPC). To achieve its purpose, GPA is connected through a network of regional coordinators from different countries and regions to facilitate the research. A research project, in Europe, "PsoBarrier", intended to identify barriers to guideline-based psoriasis care in five European countries. It had been conducted in the Institute for Health Services Research in Dermatology and Nursing (IVDP), UKE, Hamburg. To date, there is no comprehensive research yet that investigates the availability and prescription differences for psoriasis patients in different parts of the world. Therefore, this study used the GPA and the PsoBarrier information to investigate the prescription and medication availability for psoriasis treatment in Chile, Colombia, and Germany.

1-1 Psoriasis

Psoriasis is an autoimmune, relapsing, inflammatory skin disease, usually accompanied by extreme scaling (Chong, Kopecki, & Cowin, 2013; Reich, 2012). It is estimated that 125 million people globally suffer from this disease. Among various types of the disease, plaque psoriasis (psoriasis vulgaris) is most prevalent. Psoriasis has been identified as the most common autoimmune disease triggered by inappropriate immune system simulation (Krueger, 2005). Psoriasis can be diagnosed at any age. However, there is a strong tendency among those who have the genetic background to show symptoms in early adulthood. Genetics may affect the clinical display, including the age of onset, type, and severity of the disease (Lebwohl, 2003). Frequently reported symptoms by patients include itching, bleeding, and pain (Dubertret et al., 2006).

Psoriasis can appear in different types, such as plaque, guttate, pustular, inverse psoriasis, and psoriatic arthritis (PsA). The main manifestations of plaque psoriasis are itching and red lesions with covered silvery or white scale which are distributed mainly symmetrically and even over the body surface (Perera, Di Meglio, & Nestle, 2012). Guttate psoriasis refers to an acute form of psoriasis with a smaller circle to oval-shaped well-defined erythematous scaly papules and plaques up to 1 cm in size teardrop-shaped spots. The onset of guttate is either in childhood or young adulthood. It is the most widespread form of psoriasis after plaque and accounts for 10 % of psoriasis conditions (Augustin, Alexander, & Augustin, 2018; Eaton et al., 2014). Pustular psoriasis appears as sterile pustules, the skin underneath and around the pustules is red and tender. This form of psoriasis can be

localized, limited to the hands and feet, or generalized and spread all around the body (Kubota et al., 2015). Inverse psoriasis often emerges in folds and genital areas such as armpits, groin, submammary region, the anal folds, and other intertriginous areas. Different types of psoriasis lesions can concurrently appear on the body, and it can be seen in different parts of the body such as the trunk, eyelids, ears, mouth, lips and can involve with nails and joints (Augustin et al., 2018).

Disease burden and epidemiology:

Psoriasis is associated with psychological and physical burdens. As other skin disorders, the visible deformity of the skin causes negative social reactions. Patients often suffer from stigmatization leading to a psychological burden. Psoriasis adverse psychological effect on life is comparable to other chronic diseases such as cancer, congestive heart failure or myocardial infarction, diabetes, arthritis and depression (Boehncke & Schön, 2015; Gelfand, Berlin, Van Voorhees, & Margolis, 2003).

Psoriasis can be accompanied by other diseases. Some common comorbidities are metabolic syndrome (obesity, dyslipidemia, diabetes), cardiovascular diseases (hypertension, coronary heart disease, stroke). Comorbidities can contribute to an even greater burden of disease and have a tremendously negative impact on social and interpersonal relationships. As a result, causing anxiety and depression (Meier & Sheth, 2009; Michalek, Loring, John, & World Health Organization, 2016; Oliveira, Rocha, & Duarte, 2015).

A patient's Health-related Quality of life (HRQOL) is majorly affected by the disease. However, the relationship between HRQOL and disease severity is not direct, as patients with mild psoriasis may also report significant HRQOL impairment. Clinical therapies have been shown to have direct linear relationship with the patient´s quality of life. Specifically for the improvement of the skin conditions based on the Psoriasis Area and Severity Index induces an improvement in HRQOL as well (Paul et al., 2003).

The prevalence of psoriasis is found to be equal between men and women and varies from 0.14 in East Asia to 1.99% in Australasia. The prevalence rates reported striking as well in western Europe (1.07% to 3.46%), central Europe (0.62% to 5.32%), North America (0.63% to 3.60%), and high income southern Latin America (0.36% to 2.96%) (Parisi et al., 2020).

Research in Japan assumes a probable rise in prevalence in the following years (Kubota et al., 2015; Sruamsiri, Iwasaki, Tang, & Mahlich, 2018). Furthermore, it is believed that climate, sun exposure, ethnicity, and geographical aspects may have an impact on the prevalence as well. Studies suggest that the effect of one factor on prevalence of psoriasis is inadequate, and combination of factors seems to be more effective (Augustin et al., 2018; Boehncke & Schön, 2015; Jacobson, Kumar, & Kimball, 2011).

Psoriasis is a systemic disease, and its effects are not restricted to skin impairment, it also can affect other parts of the body. Nail psoriasis is common among 30-40 % of patients and is characterized by different clinical pictures. It is proved that nail involvement induce psychological stress for the patients as well as physical damage resulting in increased severity of the disease (Augustin & Ogilvie, 2010). Joint involvement is called psoriatic arthritis (PsA) with the prevalence varying from 5.94% to 23.9%. It causes inflammatory effect in joints, bones, tendons and ligaments resulting in pain, swelling, and redness (Mease & Armstrong, 2014). This form of psoriasis comes in a broad range of different categories and is associated with more severe conditions and increased loss of productivity (Reich, Krüger, Mössner, & Augustin, 2009).

The severity of the disease can fluctuate between mild to severe and symptoms can change throughout the year between the phases of inflammation and remission. Research suggests environmental factors and lifestyle choices can affect the severity and onset of the disease (Fortes et al., 2005; Gerdes, Zahl, Weichenthal, & Mrowietz, 2010). There is evidence of an increase in immature mortality rate from severe psoriasis cases, mainly due to cardiovascular comorbidities (Abuabara et al., 2010).

The severity level can be measured with different tools. In the following, the three most important instruments are described. The Body Surface Area (BSA) shows the percentage of the body affected by psoriasis. The Psoriasis Area and Severity Index (PASI) combines the severity score part of four body parts (head, upper limbs, trunk, lower limbs). The Dermatology Quality of Life Index (DQLI) consists of 10 to 12 questions about health-related quality of life in dermatological patients. Based on a classification, psoriatic patients with more than 10% BSA and PASI higher than 10 are considered as patients with moderate to severe disease. This is an important measure for management and treatment schemes

(Augustin et al., 2018; Meier & Sheth, 2009). Several treatment guidelines exist on national and international level providing information on treatment schemes.

1-2 Psoriasis treatment

Despite the fact that there is no cure for psoriasis yet, there are some therapies to control the symptoms and increase the quality of life of patients. Treatment for psoriasis is complex considering several factors such as type, severity, clinical conditions, comorbidities, patient's preference (including cost and convenience), efficacy and evaluation of the individual patient's response. Since psoriasis is a chronic disease, long-term effective and safe therapy is considered. In general, therapies inducing significant and immediate improvement in patients can have significant side effects (Augustin et al., 2014; Mason, Mason, Cork, Dooley, & Edwards, 2009; Mease & Armstrong, 2014).

Treatment guidelines for dermatologists have been developed at regional, national, and international levels. Treatment options that have been introduced to the market include topical, phototherapy systemic therapy. Table 1.1 presents the list of medications that belong to each category of treatment. It has been shown that almost half of psoriasis patients are classified as mild psoriasis; the frequently suggested treatment for this category is topical treatment. A combination of topical and Ultra Violet (UV) phototherapy is advised to increase the efficacy (Augustin et al., 2018).

Topical drugs	Glococorticostreroids, Vitamin D, Coal tar, Tazarotene, Dithranol or Calcineurin inhibitors
Non-biological systemic drugs	Apremilast, Acitretin, Ciclosporin, Fumaric acid ester, Methotrexate, Dimethy fumarate
Biological systemic drugs	Adalimumab, Broadalumab, Certolizumab, Etanercept, Guselkumab, Infliximab, Ixekizumab, Risankizumab, Secukinumab, Tildrakizumab, Ustekinumab
Biosimilars	Available for Infliximab, Etanercept and Adalimumab with different commercial names.

Table 1.1 Medications available for psoriasis

Systemic therapy is advised for moderate to severe psoriasis patients, where the topical agents are not enough for management of disease. Conventional systemic medications in

combination with other topical drugs or phototherapy is advised at the first line of treatment. Biologics have been introduced lately for the patients with moderate to severe psoriasis. They are prescribed to patients who are resistance to medication or who have previously failed treatment (Nast et al., 2017).

Biological drugs, also known as biologics or biotherapeutics, are medications manufactured from living organisms of animals, plants, or bacterial cells. Their introduction into the pharmaceutical market was a breakthrough. These medications have great efficacy in treatment of different cancers and inflammatory disease such as psoriasis and psoriatic arthritis (Kuek, Hazleman, & Ostor, 2007; Moss, 2015; Rugo, Linton, Cervi, Rosenberg, & Jacobs, 2016; Scheinberg & Castañeda-Hernández, 2014). However, availability and utilization of this crucial treatment for managing complicated disease and health conditions is, unfortunately, limited in different parts of the globe (Baer II, Maini, & Jacobs, 2014; Lammers, Criscitiello, Curigliano, & Jacobs, 2014; Monk, Lammers, Cartwright, & Jacobs, 2017; Ugarte-Gil, Silvestre, & Pons-Estel, 2015).

Although biological therapies have proven to positively impact patients' quality of life, persistence to a therapy, which means the length of period between initiation of biologics and discontinuation, may be different. Persistence to biologic therapy can be diverse depending on country, patients' characteristics, and the drug type itself. Some studies showed a higher 12-month persistence to biologics in Europe (EU) compared to the United States (US) (Arnold et al., 2016; Chastek, White, Van Voorhis, Tang, & Stolshek, 2016; Doshi et al., 2016; Zweegers et al., 2016). A study in Japan also reported a higher persistence rate than in the US and lower than in the EU, indicating heterogeneity among different countries (Sruamsiri et al., 2018).

Besides their considerable benefits, biologics can entail the risk of serious side effects (Carretero, 2012). To control the latter, different alterations in the treatment regimen and combination with other medications or methods are recommended (Norlin, 2013). A decline in hospital admissions following the application of systemic drugs such as biologics has proven its effectiveness in the treatment (Degli Esposti et al., 2018; Stern, 2003). Since the number of biologics and their expiry of patents is limited, they can be replaced by biosimilars.

Biosimilars, similar biotherapeutic products, or bio comparable are highly similar products to biologics. These products have the prospective to overcome the shortcoming in biologics utilization and can increase treatment access (Baer II et al., 2014; Lammers et al., 2014; Monk et al., 2017). It is expected that biosimilars have a more substantial role in regions with limited healthcare resources such as Latin American countries (Scheinberg et al., 2018; Strasser-Weippl et al., 2015).

1.3 Healthcare system

As of 2015, Universal Health Coverage (UHC) was specified as a target of SDGs by the United Nations general assembly. UHC is the ultimate health system that ensures equitable access to health services for everyone regardless of their socioeconomic situation and ability to pay (World Health Organization, 2016). In the following section, the current situation of the health care systems in Latin America versus the EU is illustrated.

Latin American countries are majorly suffering from a fragmented health care system in which multiple sources are responsible for providing health care (Baeza & Packard, 2006; Gottret, 2006). Fragmented health care system includes the ministries of health and social security systems. Ministries of health provide limited-benefit packages of health care for the poor population with no ability to pay, whereas the social security systems provide more beneficial packages that profit formal workers. There are exceptions of single insurance providers in Costa Rica, Colombia and Mexico with special insurance possibilities, that move toward universal coverage for the whole population (Gomez-Dantes, 2009; Knaul, Wong, & Arreola-Ornelas, 2012; Musgrove, 2010).

Health care expenditure as a percentage of Gross Domestic Product (GDP) is relatively low in the whole Latin American region compared to the EU. Table 1.2 shows health expenditures in Colombia, Chile, and Germany. This index varies between 5% to 9% and for the majority of the countries, public funding in health expenditures only accounts for 6% of GDP. There is evidence of high out of pocket payments for health expenses in the Latin American regions (Knaul et al., 2012). For example, the lowest rate for out of packet payment belongs to Uruguay with as low as 16%, and the highest rate is in Ecuador with 43% (Kanavos, Colville Parkin, Kamphuis, & Gill, 2019).

Source of financing for health care is heavily dependent on general taxation. However, the large informal economies make it hard to collect the taxes for the purpose of health care financing to a sufficient level. Despite all the fact mentioned so far, the health care expenditure as a percentage of GPD has been increased considerably during the past 15 years in most countries in the region. On the other hand, out of pocket expenditure has been boosted in Colombia, Ecuador, Panama, Peru, and Uruguay over the same period (Kanavos et al., 2019).

Overall challenges in the region include large informal economies, uneven and unequal distributed health services, and high out of pocket payments. In addition, considerable socioeconomic and regional discrepancies exist between rural and urban areas. Despite European countries that informal economy is only 10 percent of the GDP, and their focus is majorly on direct taxation, in the Latin America the informal economies account for almost one-third of the GDP that contributes to a vast struggle for financing health care through taxation. This, in turn, leads to quality and access issues in the whole region (Kanavos et al., 2019) To put it in a nutshell, despite all the improvement, the idea of universal health coverage is not yet a realistic, achievable goal for the region.

	Health expenditure	**Health expenditure per capita, PPP**	**Public health expenditure**	**Private health expenditure**	**Out-of-pocket expenditure**	**Drug expenditure**
	%GDP (2017)	current international USD (2017)	% current health expenditure (2017)	% current health expenditure (2017)	% current health expenditure (2017)	% total health expenditure (2017)
Chile	8.98	2,228.56	50.06	16,41	33.53	17.0
Colombia	7.23	1,039.16	67.80	15.89	16.31	13.9
Germany	11.25	5,922.64	77.66	9,67	12.67	14.1

* USD= U.S. dollars, GDP=Gross Domestic Product **Sources:** All data from World Bank except drug expenditure (% Total Health Expenditure) that taken from: Chile (BMI, 2018c), Colombia (BMI, 2018d), (Kanavos et al., 2019) and drug expenditure for Germany (OECD, 2020)

Table 1.2 Health Expenditure in Colombia, Chile, Germany

Chilean health care system

Chile is located in South America`s western side and is one of a few upper-middle-income countries in the region with a fast-growing economy. The Chilean health care system covers the poor population in the social security system for many years, which is in contrasts to other developing countries that prioritize the formal employed population. This, in turn, has led to higher health care indexes in Chile than other developing countries in Latin America and the world (Knaul et al., 2012; Núñez & Chi, 2013).

The Health care system in Chile consists of two major parts, a single public insurer called Fondo National de Salud (FONASA) and a group of private health insurances called Institucines de Salud Provisional (ISAPRE). According to the Chilean regulations FONASA, should buy most of its services from public providers, and reciprocally, public providers must sell most of their service to FONASA. Although people insured by FONASA can buy their service from the private sector, it will cause larger co-payments. ISAPRE beneficiaries on the other hand, can use both private and public sectors, but there is a limit for the insurance coverage (Kanavos et al., 2019).

Registration for mandatory health insurance is required for all the workers and retirees who receive social security benefits in return of paying 7% of their income or pension to the limit of 140 USD. It is up to the individual to choose the public or private insurer, but those who choose the private sector must pay another contribution fee plus the salary deductible (World Bank, 2014b). Unemployed people and those who do not receive social security benefits may use FONASA Group A scheme for unemployed and poor people (Knaul et al., 2012).

The compulsory insurance covers the majority of the population in Chile (91%). From the insured population, 76% are covered by public sector (FONASA), and 17% by private sector (ISAPRE). The rest are insured by special insurance schemes such as armed forces and universities (World Bank, 2014b). However, despite the high coverage of insurances in Chile, it has been shown that half of the total health care expenditure are provided by households as a result of insufficient insurance (FONASA, ISAPRE) coverage (Knaul et al., 2012).

Results of National Health Satisfaction and Spending Study (Estudio Nacional sobre Satisfacción y Gasto en Salud, ENSGS) in 2005 showed that the main source of health care expenditures in Chile was out-of-pocket payments (47%). This indicates a financial threat for every household. The second and the third sources for health expenditures has been identified by the same study respectively to premium payments 31% and government revenues 21%. A considerable amount of out-of-pocket goes to supplies and drug expenses (41%) (Knaul et al., 2012). There is an inequity in the health care system toward the poorer population and it is beneficial for the wealthier. It has been identified that education and health care co-payments influence utilization of health care services (Núñez & Chi, 2013).

Colombian health care system

The Colombian health care system consists of two main health insurance schemes. The contributory system is mandatory for formal workers and people with the capacity to pay. The subsidized system is responsible for the unemployed, informal sector workers and the poor population (Guerrero, Prada, Perez, Duarte, & Aguirre, 2015).

In order to achieve the universal coverage goal, the health care system in Colombia has been substantially improved since 1990. Insurance coverage has been boosted from 20% to 95% of the population. The right to choose private or public health insurance is granted in Colombia, and all citizens have access to basic health service packages. Based on the capacity to pay (CTP), people are contributing to insurance schemes and are assigned to 40 different health care providers (Entidades Promotoras de Salud, EPS). The premium of EPS is equal to 12.5% of a person's monthly income. By paying that, people benefit from the compulsory health plan (Plan Obligatorio de Salud). There is also the possibility of buying another complementary insurance or a drug prepayment package (Knaul et al., 2012).

For the population with low capacity to pay, insurance will be subsidized, and they can use the services for free from EPS. The government will pay for the basic health care package expenses to EPS. The out-of-pocket payment for Colombian in 2003 estimated up to 3% of CTP but in 2017 this amount reported to be almost 16.3% of total health care expenditure. Total health care expenditure is accounted for 7.2% of GDP, although this is above the average for other upper-middle-income countries (6.1%), it is still less than the global average of 9.2% (Guerrero et al., 2015; Knaul et al., 2012; world bank, 2017).

German health care system

Health insurance became mandatory in 2009 for every resident and registered person in Germany. Health insurance is consisting of statutory health insurance (SHI) and private health insurance (PHI). The contribution to the SHI is a percentage of the workers' income, and with an increase in income, this percentage may increase as well. However, there is a maximum income level considered; if the salary exceeded that limit, the contribution fee would not change. The average contribution fee is 14.6% of the salary. The employer is responsible for paying half of it. For those who receive unemployment or social security benefits, the contribution fee will be paid by the related benefit organization. Tax revenues are also an additional source for funding the health care system. The contribution fee for PHI, on the other hand, will depend on age, health status, individual health risk, type of coverage, and any additional services. Employers can also subsidize the premium for SHI. People insured with SHI, whereas those insured by PHI, can also cover children or spouses with no or insufficient income with no further costs. A SHI insured person is entitled to use the health services and treatment without any out of pocket payment (except for some additional expenses). All payment will be directed to the health insurance, which will then pay the service provider (Federal Ministry of Health, 2020; Institute for Quality and Efficiency in Health Care, 2015).

1.4 Inequality in healthcare

Health inequality can be defined as unethical systematic disparities in health care and health status among people that are avoidable by sensible measures (Marmot, Friel, Bell, Houweling, & Taylor, 2008; Sauaia & Dellavalle, 2009; Smith, Morris, & Shaw, 1998). Based on WHO definition, inequity is “differences [in health status], which are unnecessary and avoidable, but in addition, are considered unfair and unjust” (Petrie & Tang, 2014).

Equity in health care, can be defined as evenly distributing health services among people based on the needs rather than based on their will or their ability to pay (Núñez & Chi, 2013). Environmental and socioeconomic factors are considered as major reasons for health inequality (Whitehead, 1992). A study documented disparities in health care for dermatologic conditions, based on the type of disease, age, education, insurance coverage, ethnicity, income(Buster, Stevens, & Elmets, 2012). For patients with psoriasis in Italy, similar results in disparity were found. The results of a study showed that higher

educational levels and better professional positions were associated with the prescription of biologics. Reversely, severe disease conditions were more prevalent in the less educated and unemployed population (Naldi et al., 2017).

The inequity of access to biologics can be due to various reasons, including disapproval of usage in the treatment guidelines, drug availability issues, not having access to medical centers, high price, inadequate reimbursement schemes, cost-effectiveness, safety concerns, and a lengthy formal process of prescription for doctors (Baer II et al., 2014; Chamberlain et al., 2014; Chan et al., 2012; Joensuu et al., 2015; Laires et al., 2013; Lammers et al., 2014; Li et al., 2015; Monk et al., 2017; Rencz, 2015; Souliotis, Papageorgiou, Politi, Ioakeimidis, & Sidiropoulos, 2014; Ugarte-Gil et al., 2015). These factors may have an adverse effect on patient's treatment and quality of life. In addition to all existing problems of access to biologics in Latin America, there are reports of higher prices in the region compared to the EU for the same product (Scheinberg et al., 2018).

In the US, psoriasis patients without insurance and low income were less likely to access biologics (Takeshita et al., 2015). Another study showed barriers in receiving biologics when one has a lower income, is younger or without insurance. The expenses of psoriasis treatment are relatively high, especially in case of biologics use. The prescription of the latter medications is limited to patients with contraindications to other cheaper medications, and those who resisted other therapies (Kamangar et al., 2013). The Latin American and Caribbean countries represent a large proportion of the world's population. This region's population is almost two times more than Canada, and the US population. Conversely, the share of global health care expenditure in Latin America and the Caribbean is way lower than the one in Europe, Canada and, the US (8.5% vs. 75%) (Pan American Health Organization, 2012).

The healthcare system in Latin America is very fragmented and heterogeneous with various uneven health-coverage schemes (Burgos-Vargas, Catoggio, Galarza-Maldonado, Ostojich, & Cardiel, 2013; Strasser-Weippl et al., 2015). Some aforementioned issues for accessing biologics are particularly observable in this region (Baer II et al., 2014; Chouela et al., 2016; Monk et al., 2017). In a study in Latin America, about 50 % of rheumatologists stated that only 10 % of their patients have access to biologics through the public health care system (Ugarte-Gil et al., 2015). In some parts, patients need to claim legally against the

government for biologic treatments (Biehl, Petryna, Gertner, Amon, & Picon, 2009; Ruiz et al., 2017). The insurer refunds biologics for psoriasis in some countries in this region, such as Argentina, Colombia, Mexico, and Venezuela. Whereas in Brazil and Chile, patients have access to the medications mostly through out of pocket payment (Chouela et al., 2016; Duarte, Oliveira, & Porto-Silva, 2015).

Biosimilar treatments can be a helpful alternative to meet the need in the region. However, it has been shown that a considerable percentage of physicians is not familiar with biosimilars and their applications (Reilly & Gewanter, 2015). Despite the great potential of biosimilars, the quality of these medications is subject of concern in some of the countries in Latin America (Azevedo et al., 2019). The manufactured biosimilar products should align with WHO guidelines to ensure the products' safety. The patients should not be jeopardized by the application of uncertain quality for the sole reason of less price or developing access to treatments (Scheinberg et al., 2018). Most Latin American countries are implementing those guidelines for approving biosimilars. According to the study of Azevedo et al., there are only two validated biosimilar products available for rheumatologists in the region, and other medications are only considered intended copies and cannot be utilized due to safety issues (Azevedo et al., 2019).

2. Research questions and objectives

2.1 Research question

How is the prescription and medication availability for psoriasis treatment in Chile, Colombia, and Germany?

2.2 Objectives

The objectives of the study are:

1. To explore the situation of psoriasis patients in Chile, Colombia, and Germany.
2. To determine which medications are available for psoriasis treatment in Chile, Colombia, and Germany.
3. To determine if there are any significant differences in the prescription of medications based on age, gender, and country.
4. To determine if there are differences in the reimbursement patterns in Chile, Colombia, and Germany and whether it affects the prescription.
5. To determine the association of PASI and DLQI among participants.
6. To determine if there are any significant differences in PASI and DLQI between countries.
7. To determine if there are any significant differences in PASI and DLQI between gender categories.
8. To determine if there are any significant differences in PASI and DLQI among prescriptions categories.
9. To determine the contributing factors in the prescription of medications (non-biologic and biologic) for psoriasis patients in Chile, Colombia, and Germany.

3. Material and methods

This study was conducted using existing databases from the Institute for Health Services Research in Dermatology and Nursing (IVDP), UKE, Hamburg. The data obtained from three cross-sectional questionnaire-based surveys in Latin American countries and European countries, only related outcomes of the surveys based on research question and the objectives were considered. All three surveys have been developed by the Competence Center of Care Research in Dermatology (CVderm), UKE, Hamburg. The GPA Latin American "Health-care" survey and GPA Latin American "PsoHealth" survey collected the information on psoriasis treatment and patients in Chile and Colombia and the "PsoBarrier" EU survey collected data on patients in Germany.

3.1 Study design and participants

GPA Latin American Health care survey

The healthcare Survey was done in June to August 2018. This cross sectional survey was addressed to five dermatologists per country with good geographical coverage. The survey contained six pages of questions, requiring 10-15 min to be filled. It provided general information on the health care system and medical facilities available for psoriasis treatment in each country. The data regarding the availability of psoriasis medication in Chile and Colombia is obtained from this survey. (Appendix1)

GPA Latin American PsoHealth survey

The PsoHealth survey was a cross sectional study that gathered information regarding treatment for psoriasis in various countries and was conducted from August 2018 to January 2020. In this study, participants enrolled based on estimation. Hence, to ensure the representativeness and quality of the outcome, hospital centers in different regions of each country were selected, and the number of patients was varied in each country. Colombia and Chile were the only countries with more than 100 respondents, with 171 and 249 respectively. This survey included patients with psoriasis diagnosis and older or equal to 18 years old. The aim of this survey was to generate data on psoriasis treatment. The data related to the Chilean and Colombian population was extracted from this survey (Appendix2).

PsoBarrier EU survey

This survey was a non-interventional, multi-center, cross-sectional study which was conducted from August 2015 to August 2017 in five European countries (Denmark, Poland, Spain, United Kingdom and Germany) in order to assess the barriers in psoriasis care from patient's and physician's perspectives and generate scientific data on the quality of health care. The aim sample size was 500 patients per country. The inclusion criteria recruited patients who were clinically diagnosed with psoriasis with the age 18 years old and older. The total 496 patients from German participants was extracted from this survey (Appendix 3).

Ethical consideration and quality assurance:

For quality assurance, all three surveys were performed in accordance with the criteria of Good Epidemiological Practice and with the SOPs of Competence Center of Care Research in Dermatology (CVderm) based on DIN ISO 9001:2000, and approvals of national ethical committees were obtained. Furthermore, at the beginning of the study a written informed consent was obtained from the participants.

Variable characteristics:

An integrated dataset was merged, consisting of 916 patients from Germany, Colombia and Chile. The new database included the similar questions from PsoHealth and PsoBarrier studies about participant's age, type of psoriasis, comorbidities, habits, severity of disease by means of PASI and DLQI tools, as well as current and previous therapies. A separate database was designed for collecting the availability of the medications in Chile and Colombia. List of medications available in Germany acquired by consulting German psoriasis registry (PsoBest).

3.2 Statistical analyses

All data analyses were performed using IBM; SPSS version 26. The full syntax is shown in Appendix 1. The statistical analysis process was following the algorithm as shown in figure 3.1. The data analysis started with data entry. Similar variables from two databases (PsoHealth and PsoBarrier) were combined and merged into a new dataset. Some new variables were computed out of existing variables based on the research objectives. Some

variables were eliminated through this process, such as variable with irrelevant information for the research question and objectives. Inclusion criterium was being 18 or older at the time of study. All missing values were interpreted as “absence” of the certain status such as comorbidities or “not applicable” for example in the case of medications. For all analyses, the significance level was set to 0.05. Data was collected on a voluntary basis. Thus, a selection bias cannot be ruled out completely, which might, for example, lead to an over- or underrepresentation of a certain group.

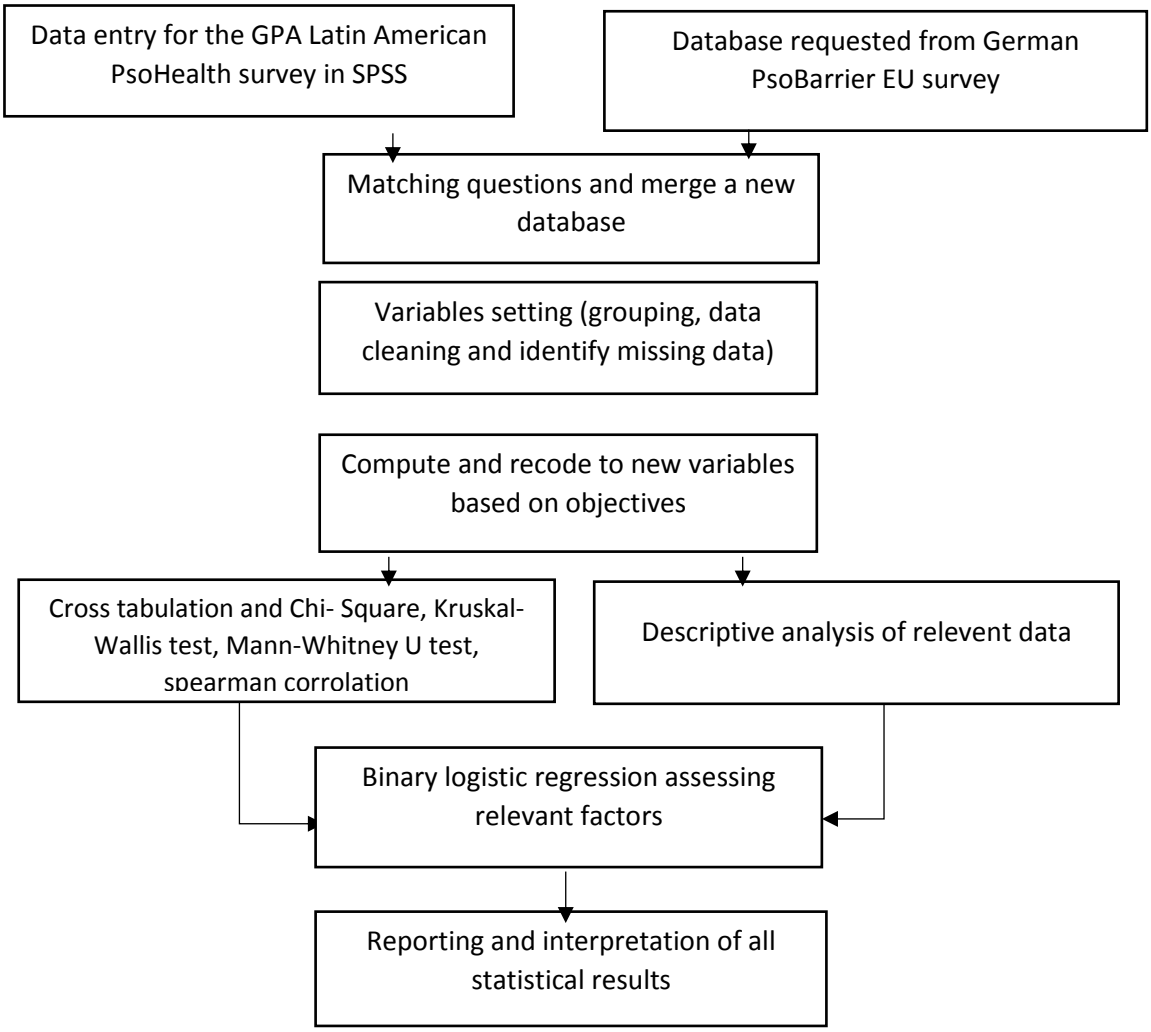

Figure 3.1 Algorithm of statistical analyses

At first, the population described by age, gender, type of disease, comorbidities, severity based on PASI and DLQI, biologic and systemic therapy prescriptions. Descriptive characteristics such ass mean, median, standard deviation, percentages were calculated for the whole study population and stratified by country. The PASI values were shown in four categories of (mild to very severe) for a better understanding of the severity

distribution. Similarly, DLQI was presented in five categories from no effect to extremely large effect.

Associations were examined by cross-tabulations for prescribed biologic and nonbiologic therapies by country, gender and age and evaluated by the Chi-Square test (X^2). Somers' *d* was run to determine the association between the PASI and DLQI categories amongst participants from each country. Since the continuous data were not normally distributed, nonparametric tests (Mann- Whitney U test) were employed to test whether there were differences between patients with or without current biologics prescription regarding continuous variables (PASI and DLQI). Furthermore, Kruskal Wallis H Tests were used to test the differences between continuous variables of countries.

Binary logistic regression was used to test the contribution of age, PASI, DLQI, and previous prescriptions in the current prescription for psoriasis patients. The data was split by country to compare the predictors contributing to current prescription per country. The outcome was the current prescription (dichotomous variable), and the predictor variables were gender (nominal), age (scale), PASI (scale), DLQI (scale), and previous medications (nominal).

The forced entry method and the hierarchical model were chosen to minimize the possibility of a suppressor effect. The suppressor effect refers to a situation that a predictor has a significant effect but only when another variable is constant (Field, 2017 p.532). Predictors were added to the model based on their correlation with the dependent variable and the blocks were compared to find out if they improve the model significantly. Whenever adding a predictor did not help the model, the previous model has been considered (Field, 2017 p. 529-232). After deciding on the best model, the model with the chosen predictors was run again, and diagnostics were saved to check for outliers. The exponential of B showed the effect size that can be interpreted similar to an odds ratio. Significance of the regression coefficients is given by the Wald statistics' p-values (Field, 2017 p.1151).

To check the assumption of the linearity of the logits, the natural logarithms of the continuous variables were computed. This assumption had tested by looking at whether the interaction term between a continuous predictor and its log transformation is

significant (Field, 2017 p. 1123, 1159). The significance shows the main effect is violated the linearity of the logits. To check multicollinearity in binary logistic regression a linear regression with the same variables was performed. This time the Variance inflation factor (VIF) values has been checked. The VIF value is an indicator for the presence of multicollinearity if it is greater than 10 (Field, 2017 p. 1160).

There were considerable missing values in the PASI score only for Chile that may have a possible effect on the binary logistic regressions. The missing values were due to a different questionnaire that had been used at the beginning of the PsoHealth survey in Chile. In that version of the questionnaire the exact score was not asked, the possible answers for PASI were only categories of mild, moderate, or severe. Since the range of score was broad from 0 to 72 and the categories were only three level (mild: ≤3, moderate: 3-10, severe: >10), it was not possible to assign a definite value to each person. Hence, these values considered as missing, wherever the exact score was needed.

4. Results

The results of all analyses presented in detail in this section. Firstly, the results for the drug availability survey per country are presented, followed by the results of the other two surveys. The participant characteristics are portrayed, including age, gender, type of psoriasis, comorbidities, PASI, DLQI, as well as medication prescriptions. Afterward, to answer the objectives, and describe the sample, results of the cross tabulations and non-parametric analyses and finally binary logistic regressions are presented.

4.1 Medication availability

Biologics and biosimilars

The healthcare survey showed that brodalumab, guselkumab, risankizumab, and tildrakizumab were not available in Chile and Colombia. In general, Colombia had more licensed biologics for psoriasis than Chile, and Germany had more licensed medication available than the two other countries (Table 4.1). The results of the health care survey showed that biologics were not reimbursed in Chile, while Colombia every licenced biologics was reimbursed. All biologics were also reimbursed in Germany. Reimbursement percentages for each medication were not reported in any country.

Biosimilars for adalimumab, infliximab, and etanercept were available in Germany and Colombia, while no biosimilar was available in Chile.

Non-biologics and biosimilars

Cyclosporine and methotrexate were mutually licensed In Chile and Colombia, furthermore, acitretin was available in Colombia. All the six non-biologics were available in Germany (Table 4.2). Acitretin, cyclosporine, and methotrexate in Colombia were reimbursed but in Chile, none were reported to be reimbursed. In Germany, reimbursement was available for all non-biologics available. Refund percentage for each medication were not reported.

	Chile	Colombia	Germany
Adalimumab	✓	✓	✓
Brodalumab	-	-	✓
Certolizumab	-	✓	✓
Etanercept	✓	✓	✓
Guselkumab	-	-	✓
Infliximab	✓	✓	✓
Ixekizumab	-	✓	✓
Risankizumab	-	-	✓
Secukinumab	✓	✓	✓
Tildrakizumab	-	-	✓
Ustekinumab	✓	✓	✓

Table 4.1 Availability biologic medications per country.

	Acitretin	Apremilast	Cyclosporine	Dimethyl fumarate	Fumaric acid esters	methotrexate
Chile	-	-	✓	-	-	✓
Colombia	✓		✓			✓
Germany	✓	✓	✓	✓	✓	✓

Table 4.2 Availability non-biologic medications per country.

4.2 Participant demographic characteristics

In total, 916 patients participated in the study, which among them 171 were from Chile, 249 from Colombia and 496 from Germany. Sample consisted of 39.6% female and 59.8% male. The mean value for age was 49.1± 14.81 years old. The distribution of gender in Chile, Colombia and Germany is displayed in table number 4.3.

	Chile		Colombia		Germany	
	Range	Mean±SD	Range	Mean±SD	Range	Mean±SD
Total	18-76	46.66±12.78	18-89	49.65±15.73	18-86	49.68±14.92
Male	18-72	46,99±11.88	20-87	50.81±15.57	18-86	48.96±16.06
Female	18-76	46.12±14.21	18-79	47.36±15.26	18-84	50.18±14.07

Table 4.3 Age and gender distribution in Chile, Colombia, and Germany (n= 911, 5 gender missing).

The majority of the patients suffered from plaque psoriasis (85.3%), guttate psoriasis consisted of 10.3% and 0.8% had pustular psoriasis and 17.8% suffered from special forms of psoriasis (consisted of inverse, generalized, intertriginous, erythrodermic, etc.). Figure 4.1 shows the psoriasis type proportion (%) in each country. It was possible for a single patient to suffer simultaneously from more than one type of disease. Furthermore, 19.8% of all participants had psoriatic arthritis. Nail involvement was observed in 36.1% of the patients with a mean value of 2.5 fingers affected. Comorbidities and smoking and alcohol consumption habits among the participants by country are presented in the table 4.4 below.

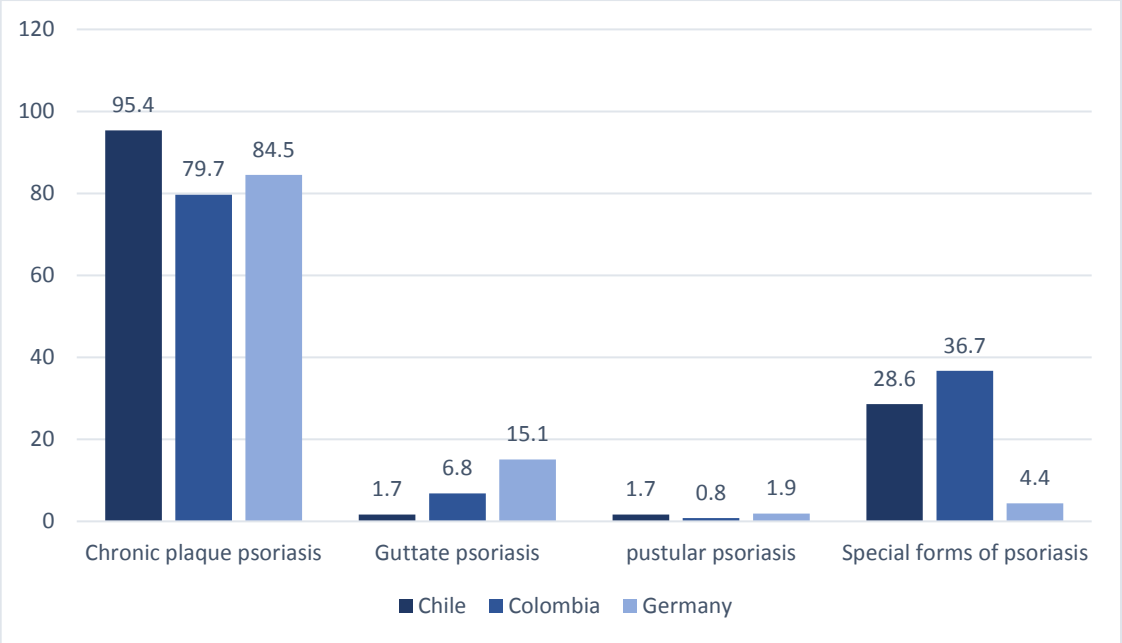

Figure 4.1 Psoriasis type distribution per country (%).

	Chile		Colombia		Germany	
	n	%	n	%	n	%
Hypertension	23	13.5	42	16.9	120	24.2
Other cardiovascular diseases	5	2.9	17	6.8	46	9.3
Diabetes	11	6.4	23	9.2	32	6.5
Dyslipidemia	16	9.4	34	13.7	29	5.8
Obesity	36	21.1	48	19.3	-	-
Depression	12	7	16	6.4	37	7.5
Other comorbidities	27	15.8	80	32.1	82	16.5
Habits:						
Smoker	31	18.1	3	1.2	79	15.9
Alcohol	45	26.3	1	0.4	0	0

Table 4.4 Comorbidities frequencies in participants.

Psoriasis Area and Severity index

The mean PASI score was 8.42±9.15 (median=5), (possible range: 0 = no disease to 72 = maximum disease severity) in the total population. In Chile, the mean PASI score was 19.10±9.08 (median=18.75), in Colombia 6.63±7.19 (median=4), in Germany 6.84±8.35 (median=3.6).

The PASI was categorized into four groups: Mild: $0 \leq PASI \leq 5$, Moderate: $5 < PASI \leq 10$, Severe: $10 < PASI \leq 20$, Very Severe: $20 < PASI$ to illustrate a better understanding. Results showed 22.3% of participants from Germany suffered from severe and very severe psoriasis, in Colombia, the comparable category had the proportion of 17.6% and in Chile 56.7%, the detail results of severity categories per country is presented in table 4.5 and the results for the total sample is shown in figure 4.2.

PASI categories	Chile		Colombia		Germany	
	n	%	n	%	n	%
0 ≤ PASI ≤ 5	8	4.7	147	59	283	57.5
5<PASI ≤ 10	9	5.3	56	22.5	99	20.1
10<PASI ≤ 20	50	29.2	30	12	65	13.2
PASI >20	47	27.5	14	5.6	45	9.1

Table 4.5 PASI categories per country.

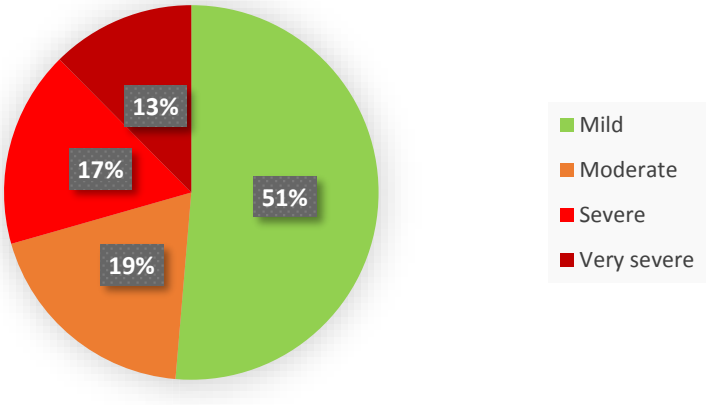

Figure 4.2 PASI categories among total participants.

Dermatology Quality of Life Index

The mean DLQI score was 7.81±7.5 (possible range: 0=no disease to 30=maximum impairment) in the total population. The maximum impairment has been found among Chilean patients. In Chile, the mean DLQI score was 15.7±6.54 (median=16), in Colombia 7.01±6.24 (median=7), in Germany 6.15±6.71 (median=4).

The DLQI score was classified into the following five categories: 0 – 1 no effect at all on patient's life, 2 – 5 small effect on patient's life, 6 – 10 moderate effect on patient's life, 11 – 20 very large effect on patient's life, 21 – 30 extremely large effect on patient's life(Hongbo, Thomas, Harrison, Sam Salek, & Finlay, 2005). In Germany, 58.1% mentioned that psoriasis has no to small effect on their life, whereas in Chile, 50.3% considered that psoriasis has a very large to extremely large adverse effect on their life.

	Chile		Colombia		Germany	
DLQI categories	**n**	**%**	**n**	**%**	**n**	**%**
No effect	-	-	23	9.2	161	32.5
Small effect	5	2.9	14	5.6	127	25.6
Moderate effect	18	10.5	23	9.2	90	18.1
Very larg effect	61	35.7	19	7.6	79	15.9
Exteremeley large effect	25	14.6	2	0.8	24	4.8

Table 4.6 DLQI categories per country.

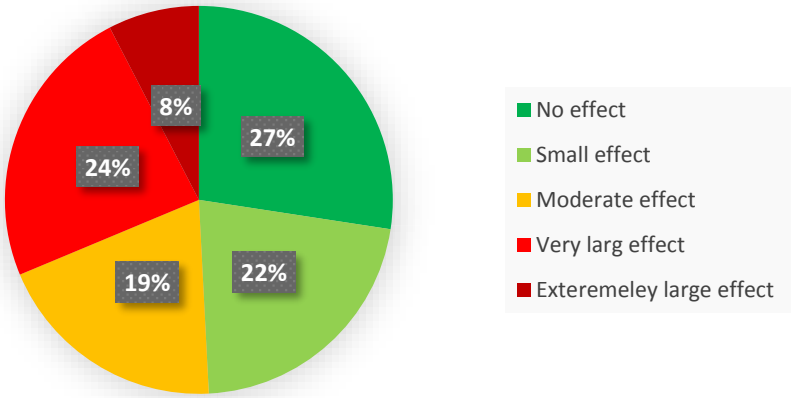

Figure 4.3 DLQI categories by total participants.

Medication's prescriptions

In general, the current biologics prescriptions boosted considerably for all patients in compared to the past prescriptions; on the other hand, current non-biologics prescription slightly decreased from the past (Figure 4.4). Biologics prescriptions in Chile was higher than in other countries (56.1% in comparison with 22.1% and 22.6% in Colombia and Germany). The prescriptions frequencies are presented in figure 4.4.

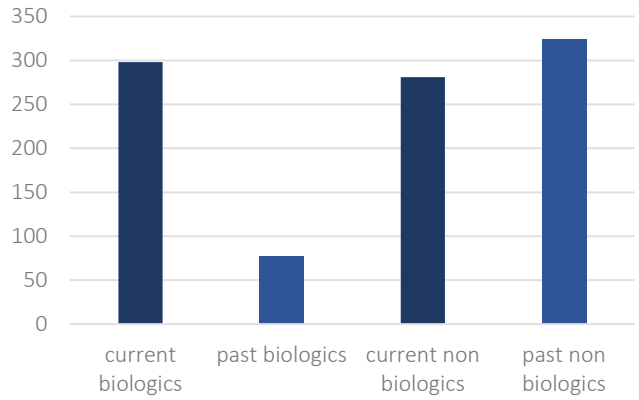

Figure 4.4 Frequencies of medication's prescriptions in total participants.

	Chile		Colombia		Germany	
	n	%	n	%	n	%
At least one current biologic	96	56.1	55	22.1	147	29.6
At least one previous biologic	5	2,9	28	11.2	44	8.9
At least one current nonbiologic	49	28.7	48	19.3	184	37.1
At least one previous nonbiologic	64	37.4	84	33.7	176	35.5

Table 4.7 Biologic and non-biologic therapies frequencies.

The most common medication among current biologics prescription in the total sample was adalimumab, and among non-biologics methotrexate. The common medications were not the same in different countries. In Chile and Colombia, methotrexate was the most current prescribed non-biologics, while in Germany fumaric acid esters was the most prescribed one. The most frequent current prescribed biologics in Chile were etanercept and Ixekizumab, in Colombia is adalimumab, and Germany was ustekinumab.

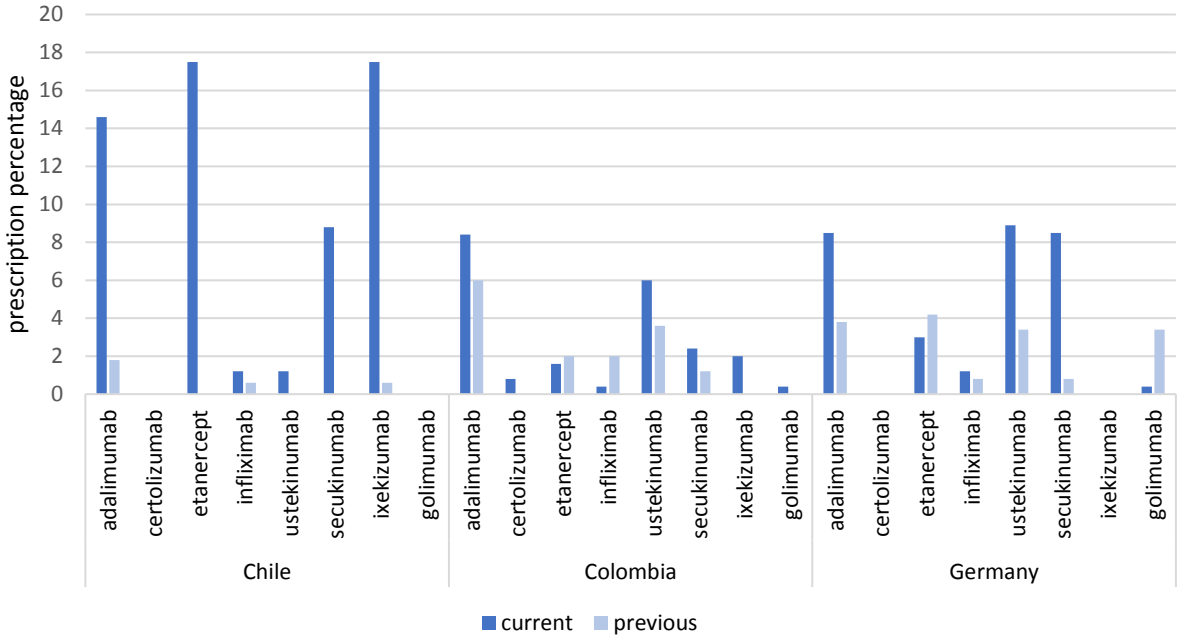

Figure 4.5 Biologic prescriptions per country (%).

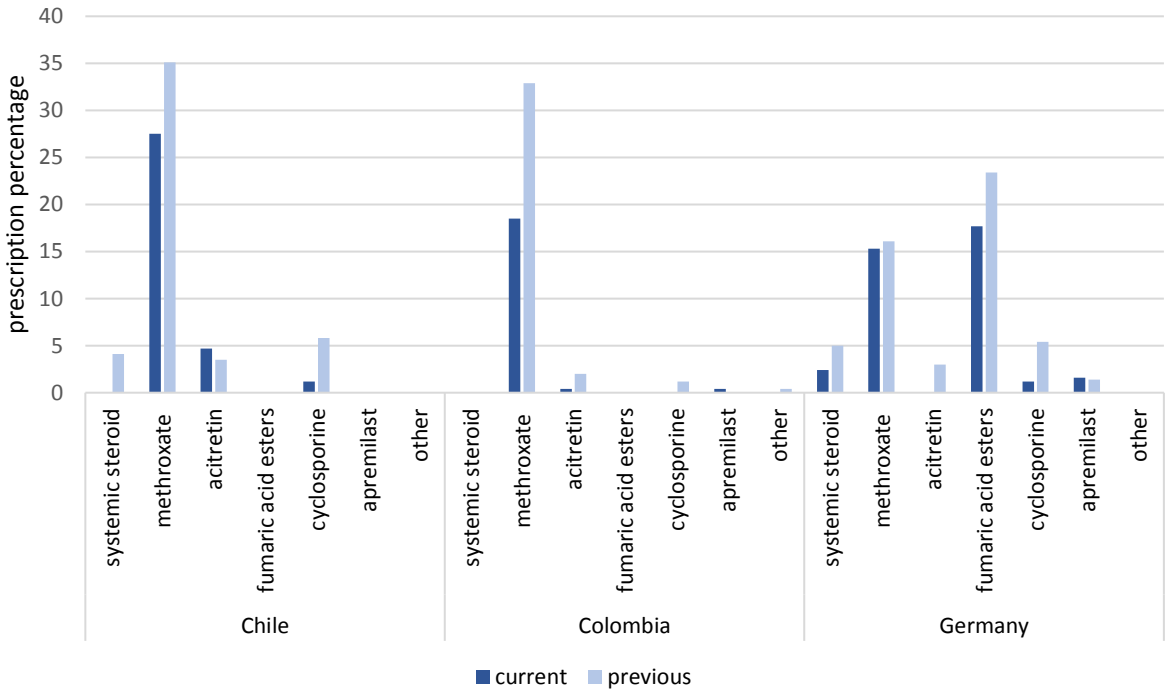

Figure 4.6 Non-biologic prescription per country (%).

4.3 Crosstabulation results

A Chi-square test of independence was performed to examine the relationship between gender, age and countries with at least one biologics prescription. The relationship between the country and age with the current prescription of biologics were significant (country: X^2 (1, n=916)=57.6, p<0.001, age: X^2(1, n=916)=6.754, p=0.009). meaning there were more biologics prescription in Chile and for adult less than 65 years old. Although the percentage of the current biologics prescription in the male category was higher, it was not significant (X^2 (1, n=911) =3,378, p=0.06).

	At least one current biologic prescription		**No current biologic prescription**		
	n	%	n	%	P-value
Country					
Chile	96	56.1%	75	43.9%	
Colombia	55	22.1%	194	77.9%	P<0.001*
Germany	147	29.6%	349	70.4%	
Age					
18 to 65 years old	266	34.2%	511	65.8%	P=0.009*
> 65 years old	32	23%	107	77%	
Gender					
Female	106	29.2%	257	70.8%	P=0.06
Male	192	35%	356	65%	

Table 4.8 Demographics of the participants by biologic prescriptions.

A Chi-square test of independence was also performed to examine the relationship between gender, age and countries with the non-biologic prescriptions. The relationship between the country with the current prescriptions of non-biologic were significant (X^2 (1, n=916) =25.16, p<0.001), meaning there were more non-biologic prescriptions in Germany.

	At least one current non-biologic prescription		**No current prescriptions non-biologic**		
	n	%	n	%	P-value
Country					
Chile	49	28.7%	122	71.3%	
Colombia	48	19.3%	201	80.7%	P<0.001*
Germany	184	37.1%	312	62.9%	
Age					
18 to 65 years old	247	31.8%	530	68.2%	P=0.084
> 65 years old	34	24.5%	105	75.5%	
Gender					
Female	114	31.4%	249	68.6%	P=0.722
Male	166	30.3%	382	69.7%	

Table 4.9 Demographics of the participants by non-biologic prescriptions.

Somer's d, was run to determine the association between PASI and DLQI categories amongst participants per country. There was a strong, positive correlation in Colombia and Germany, which was statistically significant (respectively: $d = 0.457, p < 0.001$, $d = 0.409, p < 0.001$) and there was a weak insignificant relation found in Chile ($d = 0.091$, $p = 0.265$).

4.4 Nonparametric tests

PASI and DLQI were examined for normality and homogeneity of variance. The assumption for the ANOVA test has not been met; therefore, the data had been analyzed with nonparametric test (Kruskal-Wallis H test). There were significant differences in PASI and DLQI among different countries (H= 164.285, P <0.001, H= 134.805, P <0.001). Chilean patients in the current study had a higher PASI showing more severe psoriasis conditions (median=18.75) and also had a higher median of DLQI (median=16), which indicated that psoriasis had a higher adverse effect on their life.

	Country							
	Chile		**Colombia**		**Germany**			
	Median	Range	Median	range	Median	Range	H	p
PASI score	18.75	1.6-46.6	4	0-42	3.6	0-48	164.28	P<0.001
DLQI score	16	2-30	7	0-21	4	0-30	134.80	P<0.001

Table 4.10 Differences in PASI and DLQI among different countries (Kruskal-Wallis H test).

Furthermore, DLQI and PASI were examined by the Mann-Whitney U test to determine the differences in gender categories. DLQI was not significantly different by gender in Colombia and Germany, but in Chile, female participants had a higher median score (median=19) of DLQI (U=837.5, p=0.024). PASI score was different in gender groups in Colombia, with higher median (18.9) in male participants (U=5727, p=0.026). In Germany and in Chile, no significant differences were found (Tables 4.11, 412).

	Country					
	Chile		**Colombia**		**Germany**	
DLQI	Median	Range	Median	range	Median	Range
Male	15	2-28	7	0-21	4	0-29
Female	19	6-30	7	0-20	5	0-30
U	873		590.5		25254	
Z	-2.257		-1.285		-1.769	
P	0.024*		0.199		0.077	

Table 4.11 Differences of DLQI between male and female per country (Mann-Whitney U test).

	Country					
	Chile		**Colombia**		**Germany**	
PASI	Median	Range	Median	range	Median	Range
Male	18.9	1.6-4.60	5	0-42	3.7	0-46.8
Female	17.75	3.4-42.10	3.9	0-40	3.6	0-48
U	1303.5		5727		28938.5	
Z	-0.054		-2.221		-0.162	
P	0.957		0.026*		0.871	

Table 4.12 Differences of PASI between male and female per country (Mann-Whitney U test).

Nonparametric tests (Mann-Whitney U test) were used to examine the differences of PASI and DLQI among those who had at least one biologic prescription. No significant difference was observed between the groups (for PASI: U=77972, p=0.907, for DLQI: U=53580.5, p=0.907). However, the median of both PASI and DLQI were slightly higher in the groups with non-biologic prescriptions.

	At least one current biologics prescription						
	Yes		No				
	Median	Range	Median	Range	U	z	p
PASI	4.15	0-48	5	0-46.8	77979	-1.185	0.236
DLQI	5.5	0-30	6	0-30	53580	-0.116	0.907

Table 4.13 Differences of PASI, DLQI and the current biologic prescriptions (Mann-Whitney U test).

Furthermore, nonparametric tests (Mann-Whitney) for examining the differences of PASI and DLQI among those who have at least one non-biologic prescription had been employed. A significant difference between groups and DLQI (U=457549, p=0.05) was found. Patients who did not receive a non-biologic medication had a higher median of DLQI. No significant difference was observed between the groups and PASI (U=72053.5, p=0.257). However, median of PASI was slightly higher in the groups with no non-biologic prescriptions.

	At least one current non-biologics prescription						
	yes		No				
	Median	Range	Median	Range	U	z	p
PASI	4.8	0-46.8	5	0-48	72053.5	-1.134	0.257
DLQI	5	0-27	6	0-30	45749	-1.962	0.050

Table 4.14 Differences of PASI, DLQI and the current non-biologic prescriptions (Mann-Whitney U test).

4.5 Logistic regression

Binary Logistic regression on non-biologic prescriptions

Variables were included in the order based on correlation coefficients to predict the drug prescriptions (biologics and non-biologics). Analyses were split by country since the aim of the study was to explore each country's situation and the correlation coefficients of the predictors were not the same in all countries. At first, the results for correlation in table 4.15 is shown then, binary logistic regression results Chile, then Colombia and subsequently for Germany are presented. SPSS output of supplement tables for logistic regression with the same order as here are attached in Appendix 2.

			PASI	DLQI	Age categories	Previous bio	Previous non-bio
Biologic prescriptions	Chile	r_s	-0.224*	0.240*	0.041	0.126*	0.586*
		n	114	109	171	171	171
	Colombia	r_s	-0.135*	-0.401*	-0.012	0.117*	0.398*
		n	247	81	249	249	249
	Germany	r_s	-0.326*	-0.275*	-0.127*	0.294*	0.368*
		n	491	481	496	496	496
Non-biologic prescriptions	Chile	r_s	0.188*	-0.209*	-0.115	-0.033	-0.410*
		n	114	109	171	171	171
	Colombia	r_s	0.081	-0.163	0.051	0.116*	-0.327*
		n	247	81	249	249	249
	Germany	r_s	-0.032	0.030	-0.028	-0.152*	-0.133
		n	491	481	496	496	496

* significant association.

Table 4.15 Spearman's correlation results.

Chile

The analysis included 109 patients 28.7% had current non-biologic prescriptions, the mean for PASI was 19.1026 ±9.08, for DLQI 15.76±6.54. The age group between 18 to 64 years old consisted of 90%, and 62% were men. Based on this result of binary logistic regression,

hierarchical model, presented in table 4.16, the only predictors which reduced the error rate (R^2) in prediction significantly were previous non-biologic prescription and DLQI. Although R^2 was slightly increasing, further blocks did not help predicting the current prescription for non-biologic significantly. To test if any effect of one predictor was suppressed by another, raw models were being run. Neither of predictors showed a significant difference. Therefore, a model with these two predictors was chosen and performed again to save diagnostics for checking for sign of bias (outliers and influential).

The final model was including the two significant predictors illustrated R^2 = 0.266 (Cox–Snell), 0.425 (Nagelkerke), Model $X^2(2) = 33.662$, $p < 0.001$. With one unit of DLQI increase, the chances for receiving a nonbiologic drug decreases by 12% (OR=0.876, CI:0.787-0.976, p=0.016) and previous non-biologics prescription also decreases the chance of receiving another new prescription of non-biologics by 96% (OR=0.035, CI:0.007-0.176, p<0.001). Test for linearity of the logits showed that the assumption of linearity of the logit has been met. Also, the VIF values did not show any problem of multicollinearity in the predictors.

Block	Predictors	Nagelkerke's R^2	Omnibus test	
			Chi square (df)	P-value
1	**previous non-bio prescription**	0.348	26.726(1)	<0.001*
2	**previous non-bio prescription, DLQI**	0.425	6.936(1)	0.008*
3	**previous non-bio prescription, DLQI, PASI**	0.460	3.282(1)	0.070
4	**previous non-bio prescription, DLQI, PASI, age**	0.460	0.034(1)	0.854
5	**previous non-bio prescription, DLQI, PASI, age, previous biologic prescription**	0.461	0.024(1)	0.877

Table 4.16 Model summary for regression on non-biologic prescriptions in Chile (n=109, missing=62).

Colombia

The analysis for Colombia included 81 patients, among which the mean DLQI was 7.01±6.2 and the mean PASI 6.6±7.2; among them, 60% were men and 20% were older 65 years old. The previous description included 11% of non-biologic and 33% of biologic. The hierarchical

model results presented in table 4.17. The only significant predictor was having previous prescription of non-biologics; other predictors have slightly increased the Nagelkerke's R^2, however, they were not significantly helped the model. Therefore, a model with only one predictor (previous non-biologics prescription) was refitted and diagnostics were saved. No sign of bias (outliers and influential) was observed.

To test if any effect of predictors was suppressed by another, raw models were being run. Neither of the predictors showed a significant difference. Also, the final model included all 249 cases in the analysis, and there were no missing. The result showed that R^2= 0.135 (Cox–Snell), 0.216 (Nagelkerke), Model $X^2(1)$ =36.11, p < 0.001. previous non-biologics prescription also decreases the chance of receiving another new prescription of non-biologics by 97% (OR=0.03, CI:0.004-0.224, p<0.001). Also, the VIF values did not show any problem of multicollinearity in the predictors.

Block	Predictors	Nagelkerke's R^2	Omnibus test	
			Chi square (df)	P-value
1	**previous non-bio prescription**	0.404	28.240(1)	<0.001*
2	**previous non-bio prescription, DLQI**	0.448	3.767(1)	0.052
3	**previous non-bio prescription, DLQI, PASI**	0.461	1.128(1)	0.288
4	**previous non-bio prescription, DLQI, PASI, age**	0.461	0.21(1)	0.884
5	**previous non-bio prescription, DLQI, PASI, age, previous biologic prescription**	0.487	2.390(1)	0.122

Table 4.17 Model summary for regression on non-biologic prescriptions in Colombia (n=81, missing=168).

Germany

The analysis for Germany included 476 patients, among which the median DLQI was 4 (range=0-30) and the median PASI was 3.6 (range=0-48), among which 14.3% were older 65 years old. The previous description included 35.5% of non-biologics and 8.9% of biologics. The hierarchical model findings are presented in table 4.18. The only significant predictor was having previous prescription of biologics; other predictors have slightly

increased the Nagelkerke's R^2, however, they were not significantly helped the regression model. Therefore, model with only one predictor (previous biologics prescription) was refitted and diagnostics were saved. No sign of bias (outliers and influential) was observed.

To test suppressor, raw models were being run. Neither of predictors showed a significant difference. Also, the final model included 496 cases in the analysis and there was no missing. The result showed that R^2= 0.026 (Cox–Snell), 0.036 (Nagelkerke), Model $X^2(1)$ =13.082, p < 0.001. Those who did not have previous biologics prescription have 75% less chance to receive a non-biologic (OR=0.243, CI:0.101-0.587, p=0.002). Also, the VIF values did not show any problem of multicollinearity in the predictors.

Block	predictors	Nagelkerke's R^2	Omnibus test	
			Chi square (df)	P-value
1	**previous biologic prescription**	0.032	11.248(1)	<0.001*
2	**previous biologic prescription, previous non-bio prescription**	0.042	3.592(1)	0.058
3	**previous biologic prescription, previous non-bio prescription, PASI**	0.044	0.695(1)	0.405
4	**previous biologic prescription, previous non-bio prescription, PASI, DLQI**	0.050	2.135(1)	0.144
5	**previous biologic prescription, previous non-bio prescription, PASI, DLQI, age**	0.050	0.086(1)	0.769

Table 4.18 Model summary for regression on non-biologic prescriptions in Germany (n=476, missing=20).

Binary logistic regression on biologic prescriptions

chile

Based on correlation to outcome variables, the independent variables were entered into the model hierarchically. Results are presented in table 4-19. The blocks related to previous non-biologics, DLQI, and previous biologics prescription were statistically significant. To test the effect of the other predictors is suppressed by another, crude models was run. The model with PASI showed a significant result therefore it was added to the final model. Therefore, a model with the four significant variables was performed. The model was

significant. The result showed that R^2= 0.339 (Cox–Snell), 0.615 (Nagelkerke). Model $X^2(4)$ =45.114, p < 0.001. If patients had a previous non-biologics prescription, the odds of being prescribed at least one biologic is 63 times more (OR= 63.57, CI= 4.99-810.62, p=0.001). If a patient had a previous biologic prescription, there is 100 percent less chance to get a biologic (OR= 0.0003, CI= 0.000005-0.027, p<.001). With an increase of one unit in DLQI the odds of receiving at least one biologic prescription were 1.4 times more (OR= 1.37 CI=1.119-1.679, p=0.002). Within one unit increase of PASI, the odds of receiving biologics decrease by 4.8% (OR=0.918, CI=847-0.995, p=0.037). No signs of linearity of logits were found for continuous variables. The test of multicollinearity showed no problem.

Block	Predictors	Nagelkerke's R^2	Omnibus test	
			Chi square (df)	P-value
1	**Previous non-biologics prescription**	0.165	10.406(1)	0.001*
2	**Previous non-biologics prescription, DLQI**	0.289	8.492(1)	0.004*
3	**Previous non-biologics prescription, DLQI, PASI**	0.332	3.153(1)	0.076
4	**Previous non-biologics prescription, DLQI, PASI, Previous biologics prescription**	0.615	23.063(1)	<0.001*
5	**Previous non-biologics prescription, DLQI, Previous biologics prescription, PASI, age**	0.617	0.218(1)	0.641

Table 4.19 Model summary for regression on biologic prescriptions in Chile (n=109, missing=62).

Colombia

Based on correlation to outcome variables, the independent variables were entered into the model hierarchically. Results are presented in table 4-20. The blocks related to previous non-biologics, DLQI and were statistically significant. To test whether the effect of the other predictors was suppressed by another, crude models were conducted. None of the predictors showed a significant difference.

Block	Predictors	Nagelkerke's R^2	Omnibus test	
			Chi square (df)	P-value
1	**DLQI**	0.188	11.936(1)	0.001*
2	**DLQI** **Previous non-biologics prescription,**	0.389	15.06(1)	<0.001*
3	**DLQI** **Previous non-biologics prescription,** **PASI**	0.389	0.005(1)	0.943
4	**DLQI** **Previous non-biologics prescription,** **PASI** **Previous biologics prescription**	0.401	0.1.001(1)	0.317
5	**DLQI** **Previous non-biologics prescription,** **PASI** **Previous biologics prescription** **Age**	0.401	0.018(1)	0.894

Table 4.20 Model summary for regression on biologics prescription in Colombia (n=81, missing=168).

So, a model with two significant variables refitted no signs of bias (influential and outliers) observed. The model included 81 cases and there were 168 missing. The result showed that R^2= 0.283 (Cox–Snell), 0.389 (Nagelkerke). Model $X^2(2)$ =26.996, p < 0.001. Based on EXP b obtained from the model with a one unit increase in DLQI, odds of receiving biologics decreases by 15% (OR=0.847, CI=0.764-0.939, p=0.002). Previous non-biologics prescription increases by 8.2 times the odds of being prescribed a biologic (OR= 8.254, CI=2.615-26.051, p<0.001). The assumptions of multicollinearity and linearity of the logits had been met.

Germany

Based on correlation to outcome variables, the independent variables were entered into the model. The results of the hierarchical model are presented in table 4-21. All blocks were significant. To test the effect of the other predictors is suppressed by another, crude models ran. None of the predictors showed a significant difference.

So, a model with five significant variables was refitted. The result showed that R^2= 0.220 (Cox–Snell), 0.313 (Nagelkerke). Model $X^2(2)$ =118.339, p < 0.001. Based on EXPs obtained from the model with previous non-biologics prescriptions, the odds of receiving biological drugs increase 4.5 times. (OR=4.554, CI=2.856-7.263, p<0.001). Also, the odds of receiving a biologic also increases 4.6 times with previous biologics prescription (OR=4.586, CI=2.039-10.316, p<0.001). With one unit increase of PASI, the chance of being prescribed new biologic decreases by 5% (OR= 0.949, CI=0.914-0.985, p=0.006). Similarly, with one unit increase of DLQI, the chance of being prescribed new biologic decrease by 6.5% (OR= 0.935, CI=0.896-0.975, p=0.002). Finally, those belong to the group of older than 65 years old, have 61% less chance to receive a biologic prescription (OR= 0.387CI=0.175-0.855, p=0.019).The assumption of linearity of logits is violated in this regression. Therefore, the results are not reliable and should interpret with cautious. The test of multicollinearity showed no problem.

Block	predictors	Nagelkerke's R^2	Omnibus test	
			Chi square (df)	P-value
1	**Previous non-biologics prescription**	0.182	65.339(1)	<0.001*
2	**Previous non-biologics prescription, PASI**	0.239	22.403(1)	<0.001*
3	**Previous non-biologics prescription, PASI Previous biologics prescription**	0.276	14.869(1)	<0.001*
4	**Previous non-biologics prescription, PASI Previous biologics prescription, DLQI**	0.298	9.523(1)	0.002*
5	**Previous non-biologics prescription, PASI Previous biologics prescription, DLQI, Age**	0.313	6.265(1)	0.012*

Table 4.21 Model summary for regression on biologics prescription in Germany (n=476, missing=20).

5.Discussion

5.1 Availability of medication

The findings of the present study indicate differences in the availabilities of therapies, which were generally more pronounced in Germany than in Latin American countries. As these data were collected by medical and dermatological specialists, it is less likely that an existing drug for the treatment of psoriasis has not been reported. Otherwise, it would indicate a serious gap in dermatologists' knowledge of psoriasis treatments. Furthermore, this result is consistent with a previous study on psoriasis in Latin American countries. The only discrepancy found was for acitretin in Chile. Literature reported acitretin available in 2016 (Chouela et al., 2016). However, based on the results this is no longer the case, this can be affected by many factors such as not enough efficacy, high price, or market changes.

Biosimilars were not available in Chile which might explain the high prescription rates in comparison with the other two countries where biosimilars were available, but a research reported biosimilar is existing for infliximab in Chile (Scheinberg et al., 2018). This can be due to existing medication but not licensed for use for psoriasis treatment. Another study of biosimilars in Latin America demonstrated the educational need with regard to biosimilars among prescribers in the region. From the 88% of biologics prescribers in this study, one third were not acquainted with the biosimilars (Reilly & Gewanter, 2015).

There was no reimbursement reported in this study for Chile; previous research claimed in Chile, almost 80 percent of the population is covered by FONSA insurance and have no coverage for biologics, but systemic therapies are covered (Chouela et al., 2016). On the other hand, copayments are available for those privately insured in Chile (20% of the population). Copayments are reported to be possible only for six months of medication use, in some cases, for maintaining biologics therapy, patients need to formally request for extensions (Chouela et al., 2016). In Colombia, reimbursement was possible in the present findings which is consistent with Choulea et al. However, they mentioned that biologics require formal applications, and reimbursements are approved when there is enough evidence showing initial fail treatments (Chouela et al., 2016). The reimbursement percentages for each medication were not obtained from the survey, so it was not possible to determine its effect on prescription for any medications.

5.2 PASI and DLQI

The proportion of the PASI categories showed that the Chilean participants suffered from more severe psoriasis in comparison with German and Colombian participants who have majorly mild psoriasis. The DLQI was also higher among Chilean participants in this study, even though there were many missing values in Chile.

The results of Somer's d showed that the impact of psoriasis on DLQI in Chilean patients was not significantly associated with the PASI, while in Colombia, and Germany significant positive associations were observed. This implies in Chile, even patients with mild psoriasis claimed to have a large effect on their quality of life that can be due to different culture or expectations amongst the Chilean patients in comparison to the German and Colombian patients. Interestingly, this finding was aligned with multiple previous research indicating that clinical severity is not related to psychological burden or quality of life impairment (Fortune, Richards, & Griffiths, 2005; Pathirana et al., 2009; Valenzuela, Silva, Valdés, & Papp, 2011).

DLQI was significantly higher among the female Chilean participants; however, another study in Chile reported higher impairment on quality of life in male participants (Valenzuela et al., 2011). The differences might be due to the fact that these studies were conducted in a different time frame with different sample characteristics and demographics might not be comparable.

5.3 Medications prescription

The medications available in each country are also prescribed for psoriasis patients and there was no inconsistency between the first survey (health-care survey) and the second survey (PsoHealth). However, some drugs that are available in Germany now, had not been prescribed to participants since, the start of the PsoBarrier study in 2015 and those medications may not be available at that time.

The chi-square test's finding showed prescription of biologics was very high in Chile; maybe this is related to a strikingly higher median of the PASI score among the participants from Chile, indicating more severe psoriasis. However, there was no relationship observed between the severity of disease and being prescribed a biologic medication. Another explanation for the high prescription rates in Chile compared to Germany might be that the

German survey has been conducted a few years before the Latin American survey (Germany: 2015-2017 vs Chile and Colombia 2018-2020). It is possible that fewer biologics treatment options existing back in 2015, lead to prescribing more non-biologic systemic.

Despite the high prescription rates in Chile, inequity is reported in Latin American regions between rural and urban areas (Chouela et al., 2016). Unfortunately, there was no evidence available from the respondents' place of residence and this sample may not be a representation of the whole Chilean society. Furthermore, previous research revealed high rates of prescribing biologics to the higher socioeconomic proportion of psoriasis patients. In Italy also inequity existed in terms of access to biologics therapy among psoriatic patients in higher socio-economic sectors of the population (Naldi et al., 2017).

The findings of the chi-square test showed that PASI and DLQI did not influence prescription, although the guidelines of Latin America and Europe for psoriasis treatment recommended systemics and biologics for moderate to severe psoriasis conditions. This might be explained by other factors that can simultaneously impact psoriasis treatment such as patients' preferences or better responses to a specific treatment (Augustin et al., 2014; Mease & Armstrong, 2014).

Exploring the factors contributing to prescriptions in the binary logistic regressions showed different patterns in each country. However, similarities in the prescribing of non-biologic drugs were found in all countries; if a non-biologic medication was prescribed earlier, there was a very high probability that it would not be prescribed again. In Chile, the increase in DLQI also contributed to less chance of getting non-biologics. This can be explained based on the guidelines with an increase in severity, the chance of getting biologics increases.

For the biologic prescriptions, all results except for Chile showed that severity indices (PASI, DLQI) had negatively influenced the biologics prescription in the regression models. However, the results from Germany might not had been precise as a result of the violated assumption. In other words, the chance for being prescribed a biologic declined as the severity of the disease increased. This could be because baseline data of these indices or their reduction rate were not available in Chile and Colombia. For example, if the treatment of a patient with a high baseline PASI was successful, due to the use of biologics, the PASI will decrease at the next appointments, but the patients will be prescribed biologics again

to maintain the positive treatment result. This can justify the use of biologics therapy in patients with low PASI and DLQI.

Previous non-biologics prescriptions contribute to more chance of receiving biologics. In Germany, previous biologics prescription also had a similar effect on current biologics prescription. This can be explained also by the fact that although a patient has a low severity index, this results from a successful biologics therapy and maintaining it will prevent the symptoms from appearing again.

Age had a significant negative effect on biologics prescription only in Germany. In the guidelines for psoriasis on systemic treatment recommendations for adults suggested that due to limited evidence on treatment of patients over 65 years old, should be treated similarly to the adults group aging between 18 to 65years old. (Kogan et al., 2019).

Limitation and future research suggestion

This study was a cross-sectional survey, so the results cannot be generalized, and the sample size may not be a representative of the whole psoriasis patients in these countries. A cohort study in all three countries may yield more precise information. There is no registry for psoriasis patients in Chile and Colombia that might lead to loss of great evidence in psoriasis treatment for the patients in Latin American regions. The present research did not take the socio-economic factors and place of residence into account, which might affect the results. The baseline PASI and DLQI and the improvement rate information were not collected in these surveys because the surveys' primary aim was different from the present thesis. This PASI related information should be documented based on the available guidelines for psoriasis treatment; in future research, this can also be considered as an important factor in treatment and medication use.

Moreover, there was no evidence of treatment satisfaction gathered in the Latin American survey; this can have a significant role in impacting the quality of life in patients and can be subject to future research. Furthermore, future research can also investigate the compliance of the practice treatment and the guideline in detail.

Conclusion

In conclusion, to answer the research question, the results showed differences in psoriasis medications availability in the three studied countries. Germany had access to more medications than in the other two countries. The prescription seemed not to be affected by reimbursement the in Chile where high percentages of biologic prescriptions observed with no reimbursement. Prescription percentages were similar in Germany and Colombia for biologic prescriptions. Colombia had less non-biologic prescriptions than Germany. Severity indices were strikingly higher among participants from Chile and Germany and Colombia had almost similar median values. Factors contributing to the prescription of medications, to some extent, followed the same pattern. However, the direction of their impact was varied; previous medications have an important role in new prescriptions. PASI and DLQI roles in new prescriptions were fluctuating in different regression models.

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Statutory Declaration

I hereby declare that I wrote this thesis without any assistance and used only the aids listed. Any material taken from other works, either as a quote or idea have been indicated under "References".

02.11.2020

_____ _____

Place, Date Signature

Healthcare for Psoriasis in Latin America

Latin America
Health Care Survey 2019

Psoriasis

Study coordinator
Nirohshah Trialonis-Suthakharan

Involved researchers
Prof. Dr. Matthias Augustin
Prof. Dr. Chris Griffiths

Collaborators
Global Psoriasis Atlas (GPA)
International Psoriasis Council (IPC)
International League of Dermatological Societies (ILDS)
International Federation of Psoriasis Associations (IFPA)
European Health Care Survey

Guide for completion

- This survey aims at describing aspects of health care for psoriasis.
- Collaboration has been established with the European Health Care Survey, the GPA, IPC, ILDS and IFPA. A set of data will be integrated in the Global Psoriasis Atlas project.
- The following questions refer to the situation of health care for psoriasis in your country.
- Please answer all questions as accurately as possible.
- There may be some questions which are difficult to answer (e.g. due to the lack of data). Please give us then the best available estimate.
- The data will only be used for aggregate statistical analysis.

How to participate

- Please answer the following questions and submit the questionnaire
  either by **fax**: +49 (0)40 7410-40160
  or **mail**: n.suthakharan@uke.de

How can I get the results?

Data will be summarized in a project report and submitted to all participants. Further outcomes will be published in peer review journals.

Section A **General questions**

Today's date |__|__| - |__|__| - 2019
day *month*

A1 What is your speciality?

☐ Dermatologist
☐ General practitioner
☐ I have another **speciality**:
_____

A2 Where do you work? (several answers possible)

☐ Community-based hospital
☐ Private hospital
☐ University Hospital
☐ Other academic center
☐ Private practice
☐ Public outpatient clinic
☐ Private outpatient clinic
☐ other: _____

A3 Please name your country and – if applicable – the province/state.

Country _____ Province/state _____

Please note: *Your questionnaire can only be used for analysis if you indicate your country!*

A4 How many dermatologists work in your country?

*I can give an **estimate (whole number)**:*

All dermatologists: _____
Including:
- in hospitals: _____%
- in office/private practice: _____%_

or

*I can give an **exact number**:*

All dermatologists: _____
Including:
- in hospitals: _____%
- in office/private practice: _____%

or

☐ *I cannot give any estimate.*

Estimation: _____ % male

A5a How many hospitals with dermatologic outpatients (ambulant care) exist in your country?

*I can give an **estimate(whole number)**:*

_____

or

*I can give an **exact number**:*

_____

or

☐ *I cannot give any estimate.*

A5b How many hospitals with dermatologic inpatients exist in your country?

*I can give an **estimate (whole number)**:*

_____

or

*I can give an **exact number**:*

_____

or

☐ *I cannot give any estimate.*

A5c How many dermatologic offices/practices exist in your country?

*I can give an **estimate(whole number)**:*	**or**	*I can give an **exact number**:*	**or**	☐ *I cannot give any estimate.*
_____		_____		

A5d How many other offices/practices exist in your country?

Please explain: _____

*I can give an **estimate (whole number)**:*	**or**	*I can give an **exact number**:*	**or**	☐ *I cannot give any estimate.*
_____		_____		

A6 How is the access to dermatologic care? (multiple answers possible)

Free choice of any dermatologist	☐ yes	☐ no
Direct access to certain dermatologists possible	☐ yes	☐ no
Access through GP (gatekeeper)	☐ yes	☐ no
Access through other specialists	☐ yes	☐ no

A7 What is the average waiting time for a consultation by a dermatologist in your country? (please estimate)

Procedure	**Waiting time (days)**
Regular visits for psoriasis	
Emergency visits	
Skin tumor surgery (e.g. melanoma, basal cell carcinoma)	
Allergy tests (e.g. standard patch test)	

A8 Drug prescription by dermatologists for psoriasis (please estimate)

Proportion of dermatologists prescribing topical drugs	%
Proportion of dermatologists prescribing individual formulations*	%
Proportion of dermatologists prescribing systemic drugs	%
Proportion of dermatologists prescribing biologicals	%

*individual formulations means (mostly topical) medications prescribed by the dermatologist and prepared by a pharmacist for a specific patient.

Section B **Psoriasis Care**

B1 What is the prevalence of psoriasis in your country?

*I can give an **estimate**:*	**or**	*I can give an **exact number**:*	**or**	☐ *I cannot give any estimate.*
_____ % of the general population		_____ % of the general population		

B2 What is the prevalence of psoriatic arthritis (% of psoriasis)?

*I can give an **estimate**:*	**or**	*I can give an **exact number**:*	**or**	☐ *I cannot give any estimate.*
_____ % of psoriasis patients		_____ % of psoriasis patients		

B3 How many patients with psoriasis are referred to a dermatologist?

*I can give an **estimate**:*	**or**	*I can give an **exact number**:*	**or**	☐ *I cannot give any estimate.*
_____ % of psoriasis patients		_____ % of psoriasis patients		

B4 Who can prescribe biologics for psoriasis in your country? (several answers possible)

☐ Hospitals only
☐ Hospitals and certified offices
☐ All dermatologists ☐ Certain dermatologists ☐ Dermatologists are not permitted to prescribe
☐ Other (please explain): _____

B5 Are there fixed budgets for biologics in psoriasis? (several answers possible)

☐ No fixed budgets
☐ Fixed budgets on a hospital level
☐ Fixed budgets on a regional level
☐ Fixed budgets on a national level
☐ Other (please explain): _____

B6 In your country, prescriptions for biologics are possible … (several answers possible)

☐ Only after approval by payer
☐ Only after second opinion
☐ Solely based on clinician's judgement
☐ Other (please explain): _____

B7 Are biosimilars for psoriasis available in your country?

☐ No
☐ Yes, for: O Infliximab O Etanercept O Adalimumab
☐ I don't know

B8 Are there any quotes for prescribing biosimilars in psoriasis in your country?

☐ No
☐ Yes, about ____%
☐ Yes, please specify: _____
☐ I don't know

B9 Which proportion of patients receiving biological drugs for psoriasis gets biosimilars?

*I can give an **estimate**:*	**or**	*I can give an **exact number**:*	**or**	☐ *I cannot give any estimate.*
_____ % of psoriasis patients		_____ % of psoriasis patients		

B10 Do biosimilars provide additional benefits to health care for psoriasis?

1	2	3	4	5	6
Very much	Mostly	Partly	Rather not	Not at all	Don't know

B11 To what extent do you agree with the following statements?

Agree:	Strongly	Partly	Not at all	No experience
Biosimilars are very welcome	☐	☐	☐	☐
Biosimilars are no problem at all	☐	☐	☐	☐
May widen the number of patients getting access to biologicals	☐	☐	☐	☐
May be a problem for drug safety	☐	☐	☐	☐
May be a problem for drug effectiveness	☐	☐	☐	☐
Biosimilars are strongly pushed by the payers	☐	☐	☐	☐

Section C **Psoriasis Guideline**

C1 Is there a national psoriasis guideline in your country?

☐ yes ☐ no

C2 If "yes": please answer the following questions:

The psoriasis guideline is for the ☐ induction phase ☐ maintenance phase ☐ both

	yes	no	I don't know
Is the guideline binding?	☐	☐	☐
Is the guideline required by authorities?	☐	☐	☐
Have patients been involved in the guideline development?	☐	☐	☐
Is a patient version of the guideline available?	☐	☐	☐
Are pharmacoeconomic data included in the document?	☐	☐	☐
Are pharmacoeconomic data included in the recommendations?	☐	☐	☐
Does the national dermatologic society support the use of the guideline?	☐	☐	☐
Is there a guideline for plaque type psoriasis?	☐	☐	☐
Is there a guideline for other types? If yes - please specify: _____	☐	☐	☐
Is/are there guideline(s) for juvenile psoriasis?	☐	☐	☐
Is there a guideline for psoriatic arthritis?	☐	☐	☐
Is there a guideline for comorbidity screening?	☐	☐	☐

Approximately how many dermatologists know about the psoriasis guideline?	%
Approximately how many dermatologists follow the psoriasis guideline?	%

C3 **How is psoriasis severity defined?** (multiple answers possible)

	yes	no
By the "rule of tens" (PASI, DLQI, BSA)	☐	☐
According to the European consensus paper*	☐	☐
Other: _____	☐	☐
There is a consented definition of psoriasis severity in my country	☐	☐

C4 Which outcomes are used to measure disease course of psoriasis in systemic drug treatment in your country?

Score	Always (>95%)	Mostly (60-95%)	Sometimes (40-60%)	Rarely (5-40%)	Never (<5%)
DLQI	☐	☐	☐	☐	☐
PASI	☐	☐	☐	☐	☐
BSA	☐	☐	☐	☐	☐
PGA	☐	☐	☐	☐	☐
NAPPA	☐	☐	☐	☐	☐
NAPSI	☐	☐	☐	☐	☐
PBI	☐	☐	☐	☐	☐
Other: _____	☐	☐	☐	☐	☐

* Mrowietz U, Kragballe K, Reich K, Spuls P, Griffiths CE, Nast A, Franke J, Antoniou C, Arenberger P, Balieva F, Bylaite M, Correia O, Daudén E, Gisondi P, Iversen L, Kemény L, Lahfa M, Nijsten T, Rantanen T, Reich A, Rosenbach T, Segaert S, Smith C, Talme T, Volc-Platzer B, Yawalkar N. Definition of treatment goals for moderate to severe psoriasis: a European consensus. Arch Dermatol Res. 2011 Jan;303(1):1-10

Section D **Psoriasis drugs available in your country**

	Country:	Pso			PsA			
#	**Component**	**Licensed**	**Reimbursed**	**percent**	**Licensed**	**Reimbursed**	**percent**	**Biosimilars**
	Non-biological systemic drug (NBSD)							
1	Acitretin (u. a. Neotigason®)	O	O		O	O		O
2	Apremilast (Otezla®)	O	O		O	O		O
3	Ciclosporin (e.g. Immunisporin®)	O	O		O	O		O
4	Dimethylfumarate (Skilarence®)	O	O		O	O		O
5	Fumaric acid esters/DMF+MEF	O	O		O	O		O
6	Leflunomid (e.g. Arava®)	O	O		O	O		O
7	Methotrexat (e.g. Lantarel®)	O	O		O	O		O
8	Tofacitinib (Xeljanz®)	O	O		O	O		O
9	Other:	O	O		O	O		O
	Biological systemic drugs (BSD)							
1	Adalimumab (Humira®)	O	O		O	O		O
2	Brodalumab (Kyntheum®)	O	O		O	O		O
3	Certolizumab (Cimzia®)	O	O		O	O		O
4	Etanercept (e.g. Enbrel®)	O	O		O	O		O
5	Golimumab (Simponi®)	O	O		O	O		O
6	Guselkumab (Tremfya®)	O	O		O	O		O
7	Infliximab (e.g. Remicade®)	O	O		O	O		O
8	Ixekizumab (Taltz®)	O	O		O	O		O
9	Secumkinumab (Cosentyx®)	O	O		O	O		O
10	Tildrakizumab (Ilumetri®)	O	O		O	O		O
11	Ustekinumab (Stelara®)	O	O		O	O		O
12	Other:	O	O		O	O		O

- The survey is over now. Please check if you answered all questions –

Please leave us your address if you like to be informed about the results.
E-mail would also be sufficient.

Name _____
Institution _____
Address _____
Postal code, city _____ _____
Country _____
E-mail _____

Are you interested in participating in further health care surveys?

☐ Yes

☐ No

Thank you very much for your participation!

For correspondence

Nirohshah Trialonis-Suthakharan / Prof. Dr. Matthias Augustin
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Questionnaire for Psoriasis Treatment

Center: _____

City: _____

Dear colleague,
Please, fill this questionnaire of psoriasis treatment for every participating patient.
Thank you!

Study Center:

Institute and German Center for health Services Research in Dermatology
Director: Prof. Dr. med. Matthias Augustin
University Hospital Hamburg-Eppendorf
Martinistrasse 52, 20246 Hamburg, Germany
info@psobarrier.eu
www.dermasurvey.eu

Collaboration with:

Global Psoriasis Atlas
IPC – International Psoriasis Council
International Federation of Psoriasis Associations

Inclusion Criteria

Please, make sure that the patient fulfils the inclusion criteria and select the options below.

Inclusion Criteria			YES	NO
1	**Age**	≥ 18 years old	O	O
2	**Comprehension**	The patient understands the study and is able to fill out the proposed survey	O	O
3	**Consent**	The patient is willing and accepts to fill out the survey	O	O

Questionnaire for dermatologists. **Date**: |__|__|.|__|__|. 2 0 |__|__| **Doctor**: _____

Height (cm) |__|__|__| **Weight (kg)** |__|__|__| **Age (years)** |__|__|__| **Gender** O **m** O **f**

Characteristics	Psoriasis O plaque O guttate O intertriginous O pustular O generalized O special forms:
Onset	Year of first symptoms onset: _____ Year of first diagnosis: _____
Nail Psoriasis	O No O Yes → Number of affected finger nails (1-10): |__|__|
Psoriatic Arthritis	O No O Yes → O Enthesitis O Dactylitis O Spondylitis O Polyarthritis O Oligoarthritis
Comorbidities	O No O Yes → O hypertension O other cardiovascular: O depression O diabetes O dyslipidemia O hepatopathy O nicotine O alcohol O drugs O obesity O other: _____
Severity	PASI (0-72): |__|__| BSA (0-100): |__|__| DLQI (0-30): |__|__| PGA (0-4): |__|__|

*(Several answers possible)

Psoriasis treatment: previous and current (Several answers possible)

		Previous	Current
	Topical treatment		
1	Topical Steroids	O	O
2	Vitamin D Analogues	O	O
3	Combination 1 and 2	O	O
4	Anthralin/dithranol	O	O
5	Salicylic acid	O	O
6	Coal Tar	O	O
7	Other:	O	O
	Non Biologic Drugs		
8	Acitretin	O	O
9	Apremilast	O	O
10	Ciclosporine	O	O
11	Systemic Steroids	O	O
12	Methotrexate	O	O
13	Other:		

		Previous	Currrent
	Biologic Drugs		
14	Adalimumab (Humira®)	O	O
15	Brodalumab (Kyntheum®)	O	O
16	Certolizumab (Cimzia®)	O	O
17	Etanercept (Enbrel®)*	O	O
18	Golimumab (Simponi®)	O	O
19	Guselkumab (Tremfya®)	O	O
20	Infliximab (Remicade®)*	O	O
21	Ixekizumab (Taltz®)	O	O
22	Secukinumab (Cosentyx®)	O	O
23	Ustekinumab (Stelara®)	O	O
24	Others:	O	O
	Phototherapy		
25	UVB Phototherapy	O	O
26	Psoralen + UVA (PUVA)	O	O
27	Other:		

Comedications (Select all options possible)

	Drugs		**Type**
1	Analgesics	O	
2	Anti-depressants	O	
3	Anti-diabetics	O	
4	Anti-hypertensives	O	
5	Anti-inflammatory	O	
6	Anti-lipids	O	
7	Others	O	

Comments:

PsoBarrier EU

Barrier analysis of guideline-compliant healthcare for psoriasis in Europe

Questionnaire on Psoriasis Health Services

Patient Questionnaire

«ID»

Pseudonymization number

Dear patient,

Your physician has given you this questionnaire and would like you to take part in a study concerning the current health service situation for psoriasis. We would like to thank you for your willingness to participate in the survey.

Please fully complete the following pages and verify that you have **checked off an answer/answers for every question**.
You should need approximately 30 minutes to complete the questionnaire.

Thank you!

Study Center:

CVderm – German Center for Health Services Research in Dermatology

CVderm
German Center for Health Services Research in Dermatology

Director: Prof. Dr. med. Matthias Augustin
University Medical Center Hamburg-Eppendorf
Martinistrasse 52, 20246 Hamburg, Germany
info@psobarrier.eu

Date of completion: (MM/DD/YYYY): |__|__| |__|__| |__|__|__|__|

Please answer the following questions about yourself.

Age: |__|__| **Sex:** O male O female

Zip code of your place of residence: |__|__|__|__|__|

What is your highest level of education?

O Did not graduate
O Elementary school
O Middle school/junior high
O High school, college/university
O Graduation from a different school: _____

What degrees do you hold?
(Multiple answers possible)

O Vocational training
O (Technical) college degree:
O Bachelor O Master
O Doctorate
O Other degree: _____
O No certificate of completion

What is your marital status?

O single
O in a relationship
O married
O separated
O divorced
O widowed

Do you live alone?

O yes O no → with |__|__| additional people at home

Do you have children?

O no O yes, |__| children, |__| live at home

Your current situation (please mark <u>every statement that applies</u>):

O employed, working |__|__|.|__| hours per week
O stay-at-home mom / stay-at-home dad
O trainee or retrainee
O pupil or student
O volunteer work
O currently unable to work
O retired / pensioned (<u>not</u> due to psoriasis)
O permanently unable to work / early retirement (due to psoriasis)
O permanently unable to work / early retirement (other reasons)
O other work situation: _____
O long-term leave or released from work (e.g. parental leave) O unemployed

What kind of health insurance do you have?

O public health care without supplemental coverage

O public health care plus private supplemental coverage

O solely private health care

O no health insurance

O other health insurance: _____

What is the name of your insurance company?

_____

Do you smoke?

O yes, for |__|__| years O no

If 'yes': how much do you smoke on average <u>per day</u>?

Please enter the number of:

|__|__| Cigarettes
|__|__| Pipes
|__|__| Cigars, Cigarillos
|__|__| Joints

If 'no':

O Ex-smoker (have already smoked for at least one year)

I smoked for approximately |__|__| years: please enter the amount and what you smoked above

O never smoked or smoked for less than one year

How often do you usually drink alcohol?

O never

O less than once per week

O once per week

O several times per week

O daily

If you drink alcohol, how much do you currently drink on average per week?

|__|__| glasses of beer (10 oz.)

|__|__| glasses of wine or champagne (8.5 oz.)

|__|__| cocktails, glasses of liqueur, vermouth, etc. (1 $^{1}/_{3}$ oz.)

|__|__| glasses of spirits, rum, brandy, etc. ($^{2}/_{3}$ oz.)

Please note your current (or last) therapy here:

Therapy: _____

Carried out until: |__|__| |__|__|__|__| (month, year)

Are you <u>currently unable to work</u> due to your psoriasis?

O yes, for the past |__|__|__| days O no

If you are employed: How many days were you unable to work in the last 12 months due to psoriasis?

For |__|__|__| days

O was not working over the last 12 months

O psoriasis has not affected my ability to work

How often have you been admitted to the hospital (for at least 1 night) in the last 5 years due to your psoriasis?

_____ hospital stays

How much has your psoriasis affected the following areas?

Please mark the box that applies in each row!

applies:	**not at all**	**hardly**	**moderately**	**very much**	**completely**	*does not apply to me*
Career choice	O	O	O	O	O	O
Finding a job	O	O	O	O	O	O
Keeping a job	O	O	O	O	O	O
Working full-time	O	O	O	O	O	O
Career development	O	O	O	O	O	O

Do you have first-degree relatives (parents/siblings/children) who suffer or have suffered from psoriasis?

O no yes: O parents O siblings O children

With the following questions, we would like to learn more about the development of your psoriasis.

Progression of your psoriasis

Which year did changes to your skin appear for the first time?

|__|__|__|__|

At that point in time were you...?

pupil/student ☐ employed ☐
stay-at-home mom/dad ☐ unemployed ☐

What was your marital status at that point in time?

single ☐ separated ☐
in a relationship ☐ divorced ☐
married ☐ widowed ☐

Which year did you see a physician for the first time due to changes to your skin?

|__|__|__|__|

Which physician did you see?

General practitioner ☐
Dermatologist ☐
other: ☐ _____

If the first physician you saw was not a dermatologist: were you referred to a dermatologist?

yes ☐
no ☐

Was psoriasis detected immediately?
Which year were you diagnosed with psoriasis for the first time?
Which physician diagnosed your psoriasis?

yes ☐ no ☐

|__|__|__|__|

General practitioner ☐
Dermatologist ☐
other: ☐ _____

Which degree of severity of your psoriasis was diagnosed at that point?

slight ☐ moderate ☐ severe ☐ do not know ☐

What was the first kind of therapy that was prescribed at that point?

Topical (ointments) ☐
Phototherapy ☐
Systemic therapy (tablets or injections) ☐
do not know ☐

Have you since changed the type of therapy?

no ☐ yes ☐ because...

Please mark every box that applies:

Therapy did not work ☐
Severity changed ☐
Unable to tolerate the therapy ☐
Therapy was too complicated ☐
Other reasons: _____ ☐
do not know ☐

How often have you changed the type of therapy in total up to now?

|__|__| times

Dermatology Live Quality Index (DLQI)

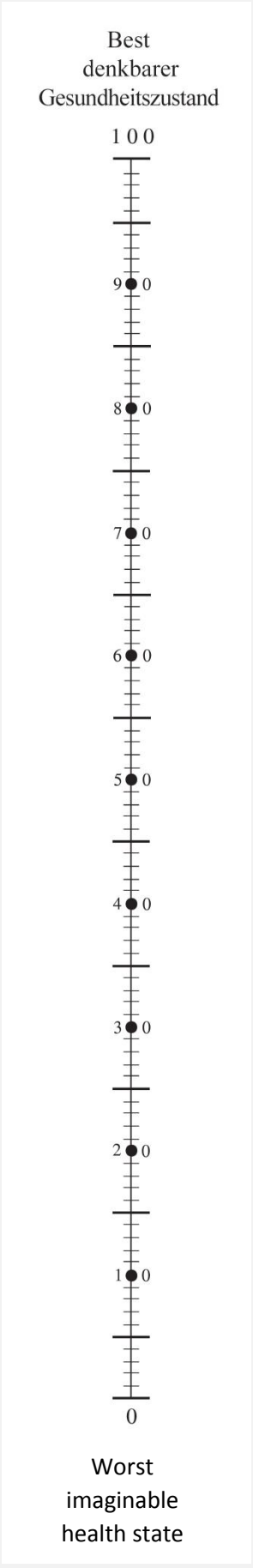
The aim of this questionnaire is to measure how much your skin problem has affected your life OVER THE LAST WEEK. Please tick one box for each question.

1.	Over the last week, how **itchy, sore, painful** or **stinging** has your skin been?	Very much A lot A little Not at all	O O O O	
2.	Over the last week, how embarrassed or **self conscious** have you been because of your skin?	Very much A lot A little Not at all	O O O O	
3.	Over the last week, how much has your skin interfered with you going **shopping** or looking after your **home** or **garden**?	Very much A lot A little Not at all	O O O O	Not relevant O
4.	Over the last week, how much has your skin influenced the **clothes** you wear?	Very much A lot A little Not at all	O O O O	Not relevant O
5.	Over the last week, how much has your skin affected any **social** or **leisure** activities?	Very much A lot A little Not at all	O O O O	Not relevant O
6.	Over the last week, how much has your skin made it difficult for you to do any **sport**?	Very much A lot A little Not at all	O O O O	Not relevant O
7.	Over the last week, has your skin prevented you from **working** or **studying**? If "No", over the last week how much has your skin been a problem at **work** or **studying**?	Yes No A lot A little Not at all	O O O O O	Not relevant O
8.	Over the last week, how much has your skin created problems with your **partner** or any of your **close friends** or **relatives**?	Very much A lot A little Not at all	O O O O	Not relevant O
9.	Over the last week, how much has your skin caused any **sexual difficulties**?	Very much A lot A little Not at all	O O O O	Not relevant O
10.	Over the last week, how much of a problem has the **treatment** for your skin been, for example by making your home messy, or by taking up time?	Very much A lot A little Not at all	O O O O	Not relevant O

To help people say how good or bad a health state is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked 100 and the worst state you can imagine is marked 0.

We would like you to indicate on this scale how good or bad your own health is today, in your opinion. Please do this by drawing a line from the box below to whichever point on the scale indicates how good or bad your health state is today.

Your own health state today



Hospital Anxiety and Depression Scale (HADS)

R.P. Snaith and A.S. Zigmond, 1983, 1992, 1994.

This questionnaire is designed to help your clinician to know how you feel.
Read each item below and tick one box for each question. Don't take too long over your replies, your immediate reaction to each item will probably be more accurate than a long, thought-out response.

I feel tense or 'wound up' O Most of the time O A lot of the time O From time to time, occasionally O Not at all	**I feel as if I am slowed down** O Nearly all the time O Very often O Sometimes O Not at all
I still enjoy the things I used to enjoy O Definitely as much O Not quite so much O Only a little O Hardly at all	**I get a sort of frightened feeling like 'butterflies' in the stomach** O Not at all O Occasionally O Quite often O Very often
I get a sort of frightened feeling as if something awful is about to happen O Very definitely and quite badly O Yes, but not too badly O A little, but it doesn't worry me O Not at all	**I have lost interest in my appearance** O Definitely O I don't take as much care as I should O I may not take quite as much care O I take just as much care as ever
I can laugh and see the funny side of things O As much as I always could O Not quite so much now O Definitely not so much now O Not at all	**I feel restless as if I have to be on the move** O Very much indeed O Quite a lot O Not very much O Not at all
Worrying thoughts go through my mind O A great deal of the time O A lot of the time O Not too often O Very little	**I look forward with enjoyment to things** O As much as I ever did O Rather less than I used to O Definitely less than I used to O Hardly at all
I feel cheerful O Never O Not often O Sometimes O Most of the time	**I get sudden feelings of panic** O Very often indeed O Quite often O Not very often O Not at all
I can sit at ease and feel relaxed O Definitely O Usually O Not often O Not at all	**I can enjoy a good book or radio or television programme** O Often O Sometimes O Not often O Very seldom

The following questions involve the provided health services and treatment of your psoriasis.

How would you rate the health services provided for your psoriasis over the past years?

O very good O good O average O poor O inadequate

How satisfied have you been with the treatment of your psoriasis over the past 12 months?

O very satisfied O satisfied O not satisfied O very dissatisfied

Do you feel that your physician understands and takes your psoriasis seriously?

O not at all O hardly O partially O very much O completely

How much time do you feel your physicians / caretakers have available when providing health services for your psoriasis? _____ minutes per appointment. I find this is …

O a very long time O a long time O neither too long or too short O too little time
O hardly any time at all

How would you describe your psoriasis treatment from last week?

Please mark the box that applies in each row!

applies:	**not at all**	**hardly**	**moderately**	**very much**	**completely**
The treatment is a burden to me.	O	O	O	O	O
The treatment requires a great deal of time.	O	O	O	O	O
I require help for my treatment (cannot do it alone).	O	O	O	O	O

How much time is required on average per day for your treatment?

	no time needed	less than 10 min	10-30 min	31-60 min	more than 60 min
For treatment, I need a **total time daily** of:	O	O	O	O	O

Which physicians have you seen in the last 12 months due to your psoriasis?	**How often last year?**	**No visit at all**
Dermatologist	_____	O
General practitioner (family doctor)	_____	O
Orthopedist / Rheumatologist	_____	O
Internist	_____	O
Alternative practitioner	_____	O
Other: _____	_____	O

If you have already seen different physicians due to your psoriasis: How would you rate how these physicians worked together (for example, did they discuss accompanying diseases)?

O very good O good O satisfying O sufficient O poor

O I have not seen more than one physician O I do not know if they worked together

How many different dermatologists have you seen in total since being diagnosed with psorasis?

|__|__| different dermatologists since the onset of psoriasis (the physician currently providing treatment counts as 1)

Have you ever been asked about your eating habits and/or weight in connection with your psoriasis and did you receive appropriate consultation?

O yes, I have been asked and received consultation

O yes, I have been asked but did not receive consultation

O no

How regularly were you able to use your psoriasis medication over the last three months?

O irregularly O more irregularly O more regularly O regularly O always

To what extent have you been able to implement your physician's recommendations regarding modifying your habits?

O not at all O hardly O partially O very well O completely

O no recommendations received

Have you ever received professional (psychological or psychotherapeutic) help for the emotional stress caused by your psoriasis?

O yes, in the past O yes, currently in therapy O no, never

If 'yes', how often?

|__|__| completed courses of therapy |__|__| incomplete courses of therapy

If 'yes', which kind of therapy?

O Talk therapy O Behavior therapy O Depth psychology therapy

O Psychoanalysis O Other therapy: _____

If 'yes', did this therapy/these therapies help you deal with your psoriasis and the accompanying stress better?

O not helpful at all O hardly helpful O moderately helpful

O quite helpful O extremely helpful

Previous psoriasis treatment

We would like to learn more about how successful you feel the courses of therapy that were applied **over the past 5 years** *have been or currently are. Please mark only one box per row.*

Therapy applied so far	not applied	applied and **not successful at all**	applied and **not successful**	applied and **fairly successful**	applied and **very successful**
Topical therapy					
Basic care	O	O	O	O	O
Ointments with cortisone	O	O	O	O	O
Dithranol (Anthralin)	O	O	O	O	O
Protopic or Elidel	O	O	O	O	O
Ointments with salicylic acid	O	O	O	O	O
Tazarotene (Zorac)	O	O	O	O	O
Tar preparations	O	O	O	O	O
Vitamin D3 preparations (Calcipotriene, Dovonex)	O	O	O	O	O
Vitamin D3 cortisone preparations (Daivobet)	O	O	O	O	O
Systemic/biologic therapy					
Acitretin (Neotigason)	O	O	O	O	O
Adalimumab (Humira)	O	O	O	O	O
Apremilast (Otezla)	O	O	O	O	O
Ciclosporin A (e.g. Sandimmune)	O	O	O	O	O
Corticosteroids (cortisone as a tablet or injection)	O	O	O	O	O
Etanercept (Enbrel)	O	O	O	O	O
Fumaric acid esters (Fumaderm)	O	O	O	O	O
Infliximab (Remicade)	O	O	O	O	O
Infliximab (Inflectra)	O	O	O	O	O
Infliximab (Remsima)	O	O	O	O	O
Methotrexate (MTX)	O	O	O	O	O
Secukinumab (Cosentyx)	O	O	O	O	O
Ustekinumab (Stelara)	O	O	O	O	O
Phototherapy, Laser					
Balneo-phototherapy	O	O	O	O	O
PUVA	O	O	O	O	O
UVA/UVB or nbUVB at 311 nm	O	O	O	O	O
Laser	O	O	O	O	O
Climatotherapy					
High mountain areas	O	O	O	O	O
Maritime climate	O	O	O	O	O
Dead Sea	O	O	O	O	O
Other					
Patient training (seminar)	O	O	O	O	O
Acupuncture	O	O	O	O	O
Homeopathy	O	O	O	O	O
Further forms of treatment					
	O	O	O	O	O
	O	O	O	O	O

We would also like to ask a few general questions about your psoriasis.

Do you feel that you are well informed about psoriasis?

O very poorly informed O poorly informed O moderately informed
O well informed O very well informed

Do you feel that you are well informed about possible courses of therapy?

O very poorly informed O poorly informed O moderately informed
O well informed O very well informed

Where have you found information <u>about the disease</u>?
(Multiple answers possible)

O from my treating physician
O pamphlets from physician's office
O from a support group
O from the Internet
O from other sources of information:
_____

And about <u>therapies</u>?

O from my treating physician
O pamphlets from physician's office
O from a support group
O from the Internet
O from other sources of information:
_____

Have you ever taken part in <u>patient training</u> for psoriasis?

O no O yes, |__|__| times

Are you a member of a <u>psoriasis support group</u>?

O yes O no

If 'yes', since when? |__|__|__|__| (year)

How helpful has it been being a member of the group?

O not helpful at all O hardly helpful O moderately helpful
O quite helpful O extremely helpful

Do you set therapeutic goals together with your physician?

O yes O no O do not know

If 'yes', what goals did you set in the last few months together with your physician?

_____

_____

Is the progress of your treatment measured <u>in your presence</u>, for example with a numerical value? O yes O no O do not know

If 'yes', what value is used? _____

Were your needs and preferences <u>considered</u> while choosing treatment?

Preferences concerning... *were considered:*		**not at all**	**hardly**	**partially**	**very much**	**completely**	*does not apply to me*
1	Time required	O	O	O	O	O	O
2	Type of administration	O	O	O	O	O	O
3	Adverse effects	O	O	O	O	O	O
4	Cost of treatment	O	O	O	O	O	O
5	Further preferences: _____	O	O	O	O	O	O

How much do you spend on average per month on copayments (including prescription charges)?

£ |__|__|__| O I do not pay any copayments

How much do you spend on average per month on creams / care products that are <u>not reimbursed</u>?

£ |__|__|__| Own costs per month O I do not buy any care products

Which of your own costs do you have reimbursed regularly by your insurance company?

O Prescription charges

O Medication costs

O Aids and appliances

O Transportation costs, which amount to: _____

O Other: _____

O None / does not apply

Do you know how to apply for reimbursement of your own costs?

O yes O no

If 'yes': How complex is the process for you?

O not at all O slightly O average O reasonably O extremely

Have you ever decided against a therapy, treatment or referral that was recommended (but not prescribed) by a physician, because you would have had to pay for it on your own?

O yes O no If 'yes': **How often has this happened since the onset of your psoriasis?**

|__|__| times O never

Has your health insurance ever turned down a psoriasis therapy that was recommended by a physician?

O yes O partially O no

If 'yes', which kind of therapy?	**Which medication?**
O Topical (applied to skin) therapy (ointments, creams)	_____
O Phototherapy	_____
O Systemic (enteral/parenteral) therapy (tablets / injections)	_____
O Spa therapy or climatotherapy	
O Other: _____	

What reasons were given for turning down the therapy?

_____

How high is your monthly net income?

Net income is the amount of income (also: retirement/pension) that remains after subtracting taxes and deductions.
Please mark the appropriate category.
Please also indicate how many individuals this income covers.

O less than £650	O £1900 < £2200
O £650 < £980	O £2200 < £2600
O £980 < £1200	O £2600 < £3100
O £1200 < £1400	O £3100 < £5700
O £1400 < £1600	O more than £5700
O £1600 < £1900	O my own / personal net income (1 person) O net household income from multiple individuals: |__| adults and |__| children

What is your monthly available budget?

Please estimate the amount of funds that you have at your disposal each month after subtracting taxes, insurance and all running costs (e.g. for rent, food, transportation, credit, ...), but do not subtract health care related expenses (e.g. copayments, care products that are not reimbursed), even if these are regular costs.

£ |__|__|__|__| O personal budget O household budget for multiple individuals: |__| adults and |__| children

How would you rate your personal financial status in comparison with society as a whole?

O low O average O high

The following questions involve how you travel to the physician who is treating your psoriasis.

How did you come to the doctor's office today?
(Multiple answers possible)

O walked O by bike O by car O by public transportation O by taxi
O other: _____

How long is the trip to this physician's office? Please enter the amount of time needed as well as the distance. |__| hours, |__|__| minutes |__|__|__| miles

Please estimate the <u>travel costs</u> for your visit today.

£ |__|__|__|

In general: What is the maximum time/distance that you would travel for regular psoriasis treatment?

|__| hours, |__|__| minutes |__|__|__| miles

How long did you have to wait between making an appointment until your actual <u>first appointment</u> with your dermatologist?

O up to 2 weeks O more than 2 weeks, but less than 1 month
O more than 1 month but less than 2 months O longer than 2 months

What period of time do you consider it reasonable to wait for an <u>appointment with a psoriasis specialist</u>?

|__|__| weeks / |__|__| months

And what period of time do you consider it reasonable to wait for an appointment with a <u>specialist in diseases that accompany psoriasis</u>?

|__|__| weeks / |__|__| months

Many thanks for your valuable collaboration!

PsoBarrier **EU**

Barrier analysis of guideline-compliant healthcare for psoriasis in Europe

Questionnaire on Psoriasis Health Services

Physician Questionnaire

«ID»

Pseudonymization number

Dear colleague,

Please fully complete this questionnaire on psoriasis for every participating patient.

Thank you!

Study Center:

CVderm – German Center for Health Services Research in Dermatology

CVderm
German Center for Health Services Research in Dermatology

Director: Prof. Dr. med. Matthias Augustin
University Medical Center Hamburg-Eppendorf
Martinistrasse 52, 20246 Hamburg, Germany
info@psobarrier.eu

Date of completion: (MM/DD/YYYY): | | | | | | | | | | |

Inclusion / exclusion criteria

Please ensure that each patient fulfills the inclusion criteria by answering the questions below.

Inclusion criteria			YES	NO
1	**Age**	≥ 18 years	O	O
2	**Diagnosis**	Clinically evident plaque psoriasis (for at least 6 months)	O	O
3	**Understanding**	The patient understands the study and should be able to complete the questionnaire.	O	O
4	**Consent**	The patient consents to taking part in the survey.	O	O

Exclusion criteria			YES	NO
1	**Diagnosis**	Exclusively pustular psoriasis	O	O
2	**Diagnosis**	Exclusively inverse psoriasis	O	O

All inclusion criteria answered with YES	O
All exclusion criteria answered with NO	O

The patient has been included in the study	O yes O no
The patient has received the patient questionnaire	O yes O no

→ The patient questionnaire should be returned on the same day in the physician's office / clinic.

Height (feet and inches) |__|__| **Weight (pounds)** |__|__|

Characteristics of psoriasis (Multiple answers possible)	Chronic plaque psoriasis	O
	Guttate psoriasis	O
	Inverse psoriasis	O
	Pustular psoriasis	O
	Special type: _____	O

Fingernail changes	O yes O no	
	If 'yes':	
	Number of affected fingernails (1-10)	|__|__| fingernails
	of which are: completely (>90%) affected	|__|__| fingernails
	50-90% affected	|__|__| fingernails
	affected by less than 50%	|__|__| fingernails

Current psoriasis therapy
(Multiple answers possible)

O **Phototherapy**
- O Psoralen + UVA phototherapy
- O UVB phototherapy

O **Systemic steroids**

O **Biologics**
- O Adalimumab (Humira)
- O Etanercept (Enbrel)
- O Infliximab (Remicade)
- O Ustekinumab (Stelara)
- O Golimumab (Simponi)
- O Secukinumab (Cosentyx)

O **Immunomodulators**
- O Acitretin
- O Apremilast
- O Cyclosporine
- O Methotrexate
- O Fumaric acid esters
- O Retinoids

O **Biosimilars**
- O Infliximab (Inflectra)
- O Infliximab (Remsima)

O **other:** _____

*Please indicate whether the patient suffers from one or more of the **comorbid conditions**, while also asking the patient when these conditions began as well as if they are being treated and how.*

Comorbid condition	Applies	First occurrence (year)	Diagnosed by: D = Dermatologist G = General practitioner O = Other physician P = Psychotherapist	Is being treated with medication	Treatment from specialist	Monitored regularly
Cardiovascular diseases						
Arterial occlusive disease	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Cerebrovascular disease	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Essential hypertension	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Heart failure	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Coronary artery disease	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Thrombosis	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Metabolic diseases						
Type 1 diabetes	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Type 2 diabetes	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Hyperuricemia	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Lipid metabolism disorders	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Metabolic syndrome	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Liver diseases						
Cirrhosis of the liver	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Chronic hepatitis/ elevated transaminases	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Nonalcoholic steatohepatitis	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Gastrointestinal diseases						
Gastritis/Ulcers	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Chronic inflamm. bowel diseases	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Kidney diseases						
Renal insufficiency	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Pulmonary diseases						
Chronic bronchitis	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Rheumatic diseases						
Rheumatoid arthritis	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Mental illness or addiction						
Depression	O	|__|__|__|__|	**D** O **G** O **O** O **P** O	O	O	O
Smoker	O	|__|__|__|__|	**D** O **G** O **O** O **P** O	O	O	O
Former smoker	O	|__|__|__|__|	**D** O **G** O **O** O **P** O	O	O	O
Alcohol dependency	O	|__|__|__|__|	**D** O **G** O **O** O **P** O	O	O	O
Allergic diseases						
Allergic bronchial asthma	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Allergic rhinoconjunctivitis	O	|__|__|__|__|	**D** O **G** O **O** O	O	O	O
Other diseases						
	O	|__|__|__|__|	**D** O **G** O **O** O **P** O	O	O	O
	O	|__|__|__|__|	**D** O **G** O **O** O **P** O	O	O	O
There are no comorbid conditions. O						

Psoriasis arthritis: clarification

1. Has the patient already been diagnosed with **psoriasis arthritis**? O yes O no

➔ If so, in approximately which year? __ __ __ __ (please give a year) O yes O no

2. In the last 5 years, has the patient had recurring joint pains lasting more than 6 weeks in each case? O yes O no

3. Has the patient had recurring swelling of the joints in the last 12 months? O yes O no

4. In the last 12 months, has the patient had recurring morning stiffness of the joints which improved in the course of the day? O yes O no

5. In the last 12 months, has the patient had recurring pains or swelling of the distal interphalangeal predominants (DIP) of the fingers? O yes O no

6. Enthesitis: In the last 12 months, has the patient had recurring pains at the base of the tendons, particular the Achilles tendon or plantar aponeurosis? O yes O no

7. Dactylitis: In the last 12 months, has the patient had recurring painful swelling of an entire finger or an entire toe (so-called "sausage fingers")? O yes O no

8. In the last 12 months, has the patient had recurring, deep-seated lower back pain las at least 3 months, starting gradually, with morning stiffness and improving with movement? O yes O no

9. How would you assess the diagnosis of psoriasis arthritis at this point?

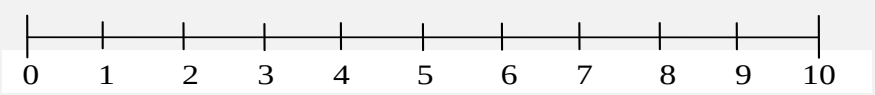
O The diagnosis is probable

O The diagnosis is uncertain

O Psoriasis arthritis can be excluded

If psoriasis arthritis has been diagnosed, how active is it at the moment?

Please put a cross on the appropriate number.



inactive very active

*Please complete the **PASI (Psoriasis Area and Severity Index)** for the patient. It is only necessary to complete the **boxes with bold frames**. The calculations are performed automatically during statistical evaluation.*

Severity of the psoriatic lesions

Please circle a number for each of the following lesions and for each location.

Severity of psoriatic lesions: 0 = none 1 = mild 2 = moderate 3 = severe 4 = very severe

		Head	Trunk	Upper Limbs	Lower Limbs
1	**Erythema**	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
2	**Induration/Thickness**	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
3	**Scaling**	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
4	**Sum**				

Percentage area affected

Please indicate in row 6 the percentage of area affected of each portion of the body. Circle the appropriate number that comes before the percentages.

5		Head	Trunk	Upper Limbs	Lower Limbs
6	**Area score (scale from 0-6)**	0 = 0% 1 = <10% 2 = 10-29% 3 = 30-49% 4 = 50-69% 5 = 70-89% 6 = 90-100%	0 = 0% 1 = <10% 2 = 10-29% 3 = 30-49% 4 = 50-69% 5 = 70-89% 6 = 90-100%	0 = 0% 1 = <10% 2 = 10-29% 3 = 30-49% 4 = 50-69% 5 = 70-89% 6 = 90-100%	0 = 0% 1 = <10% 2 = 10-29% 3 = 30-49% 4 = 50-69% 5 = 70-89% 6 = 90-100%
The following calculations are optional:					
7	**Multiply rows 4 & 6**	|__|__|	|__|__|	|__|__|	|__|__|
8		x 0.10	x 0.30	x 0.20	x 0.40
9	**Multiply rows 7 & 8**	|__|__| . |__|	|__|__| . |__|	|__|__| . |__|	|__|__| . |__|

PASI Score (sum of all values in row 9) |__|__| . |__|

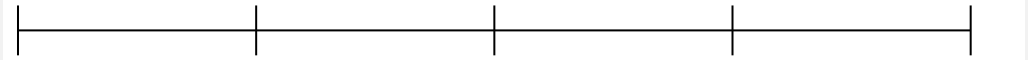
BSA (= Body Surface Area) (an explanation can be found in the folder cover)

Please enter the body surface area that is affected by psoriasis: |__|__|__| %

GCA (= Global Clinical Assessment)

Please identify the globally assessed <u>current</u> severity of psoriasis on the scale:

0	1	2	3	4	
none	mild	moderate	severe	very severe	psoriasis



How would you estimate the patient's compliance?

O very good O good O bad O very bad

The physician questionnaire has been fully completed	O yes	O no
The patient has returned the questionnaire in the office	O yes	O no

→ END OF QUESTIONNAIRE:

Please file the physician and patient questionnaires together in the study folder.

Many thanks for your valuable collaboration!

Appendix 4

SPSS syntax of statistical analysis

```
SELECT IF (age ge 18).
*Computing special forms of psoriasis type to make two surveys comparable.
COMPUTE special_forms=SUM(Generalized,Intertriginous,specialforms,Inverse).
EXECUTE.
*age, pasi and dlqi categories.
RECODE Age (18 thru 64=1) (64 thru Highest=2) INTO age_cat.
EXECUTE.
RECODE DLQI (0 thru 1=1) (2 thru 5=2) (6 thru 10=3) (11 thru 20=4) (21 thru 30=5) INTO DLQI_NEW.
EXECUTE.
RECODE PASI (0 thru 5=1) (5 thru 10=2) (10 thru 20=3) (20 thru Highest=4) INTO PASI_NEW.
EXECUTE.
*counting at least one previous biomedications.
COUNT previousbio=Adalimumab Certolizumab Etarnecept Infliximab Ustekinumab Secukinumab
Ixekizumab Golimumab Guselkumab(2 thru Highest).
EXECUTE.
*at least one previous bio.
RECODE previousbio (1 thru Highest=1).
EXECUTE.
*counting at least one previous nonbiomedications.
COUNT previousnonbio=Systemic_steroids Methotrexate Acitretin Fumaric_acid Ciclosporin Apremilast
   other_nonbiologics(2 thru Highest).
EXECUTE.
*at least one previous non-bio.
RECODE previousnonbio (1 thru Highest=1).
EXECUTE.
*count otrher comorbidites.
COUNT comorbidities=hypertension Depression CVS Diabetes Dyslipidemia Obesity Hepatopathy
```

```
   Other_comorbidities(1).
VARIABLE LABELS  comorbidities 'comorbidities'.
EXECUTE.
*Counting current bio medications.
COUNT biologicscount=Adalimumab Certolizumab Etarnecept Infliximab Ustekinumab Secukinumab
   Ixekizumab Golimumab Guselkumab(1).
VARIABLE LABELS  biologicscount 'overallbiologicscurrent'.
EXECUTE.
*at least one current bio.
RECODE biologicscount (1 thru Highest=1).
EXECUTE.
*Counting current nonbio medications.
COUNT nonbiologics_current=Systemic_steroids Methotrexate Acitretin Fumaric_acid Ciclosporin
Apremilast
   other_nonbiologics(1).
EXECUTE.
*at least one current non-bio.
RECODE nonbiologics_current (1 thru Highest=1).
EXECUTE.



*Descriptives.
* age by country and gender.
select if (age ge 18).
temp.
select if (country eq 1 and gender eq 1).
FREQUENCIES VARIABLES=Age
   /FORMAT=NOTABLE
  /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN
  /ORDER=ANALYSIS.
```

```
temp.
select if (country eq 1 and gender eq 2).
FREQUENCIES VARIABLES=Age
    /FORMAT=NOTABLE
  /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN
  /ORDER=ANALYSIS.

temp.
select if (country eq 2 and gender eq 1).
FREQUENCIES VARIABLES=Age
    /FORMAT=NOTABLE
  /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN
  /ORDER=ANALYSIS.

temp.
select if (country eq 2 and gender eq 2).
FREQUENCIES VARIABLES=Age
    /FORMAT=NOTABLE
  /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN
  /ORDER=ANALYSIS.

temp.
select if (country eq 3 and gender eq 1).
FREQUENCIES VARIABLES=Age
    /FORMAT=NOTABLE
  /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN
  /ORDER=ANALYSIS.

temp.
```

```
select if (country eq 3 and gender eq 2).
FREQUENCIES VARIABLES=Age
    /FORMAT=NOTABLE
  /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN
  /ORDER=ANALYSIS.

*frequencies psoriasis type, nail involvemnet PsA, comorbidities.
FREQUENCIES VARIABLES=plaque Guttate postular special_forms
  /ORDER=ANALYSIS.

  DESCRIPTIVES VARIABLES=Nails_number
  /STATISTICS=MEAN STDDEV MIN MAX.

FREQUENCIES VARIABLES=PsA hypertension Depression CVS Diabetes Dyslipidemia Obesity
    Other_comorbidities
  /ORDER=ANALYSIS.
FREQUENCIES VARIABLES=Smoker Alcohol PASI DLQI
  /ORDER=ANALYSIS.

 * PASI & DLQI.
 FREQUENCIES VARIABLES=PASI DLQI
  /FORMAT=NOTABLE
  /STATISTICS=STDDEV MINIMUM MAXIMUM MEDIAN MEAN
  /ORDER=ANALYSIS.

FREQUENCIES VARIABLES=PASI_NEW
  /ORDER=ANALYSIS.

FREQUENCIES VARIABLES=DLQI_NEW
  /ORDER=ANALYSIS.
```

```
*MEDICATION FREQUENCY.
FREQUENCIES VARIABLES=nonbiologics_current previousnonbio biologicscount previousbio
  /ORDER=ANALYSIS.

  FREQUENCIES VARIABLES=Systemic_steroids Methotrexate Acitretin Fumaric_acid Ciclosporin
Apremilast other_nonbiologics
  /ORDER=ANALYSIS.

FREQUENCIES VARIABLES=Adalimumab Certolizumab Etarnecept Infliximab Ustekinumab Secukinumab
    Ixekizumab Golimumab Guselkumab
  /ORDER=ANALYSIS.


*crosstabs.
CROSSTABS
  /TABLES=age_cat BY biologicscount
  /FORMAT=AVALUE TABLES
  /STATISTICS=CHISQ PHI
  /CELLS=COUNT ROW
  /COUNT ROUND CELL.
CROSSTABS
  /TABLES=Gender BY biologicscount
  /FORMAT=AVALUE TABLES
  /STATISTICS=CHISQ
  /CELLS=COUNT ROW
  /COUNT ROUND CELL.

CROSSTABS
```

```
  /TABLES=country BY biologicscount
  /FORMAT=AVALUE TABLES
  /STATISTICS=CHISQ
  /CELLS=COUNT ROW
  /COUNT ROUND CELL.

CROSSTABS
  /TABLES=Gender BY nonbiologics_current
  /FORMAT=AVALUE TABLES
  /STATISTICS=CHISQ
  /CELLS=COUNT ROW
  /COUNT ROUND CELL.

CROSSTABS
  /TABLES=country BY nonbiologics_current
  /FORMAT=AVALUE TABLES
  /STATISTICS=CHISQ
  /CELLS=COUNT ROW
  /COUNT ROUND CELL.

CROSSTABS
  /TABLES=age_cat BY nonbiologics_current
  /FORMAT=AVALUE TABLES
  /STATISTICS=CHISQ
  /CELLS=COUNT ROW
  /COUNT ROUND CELL.

CROSSTABS
  /TABLES=PASI_NEW BY DLQI_NEW
  /FORMAT=AVALUE TABLES
```

```
  /STATISTICS=CHISQ GAMMA D CTAU
  /CELLS=COUNT
  /COUNT ROUND CELL.


*normality.
EXAMINE VARIABLES=Age PASI DLQI
  /PLOT BOXPLOT HISTOGRAM NPPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.

*non-parametric Tests.

NPAR TESTS
  /K-W=PASI DLQI BY country(1 3)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS.

NPAR TESTS
  /M-W=DLQI BY Gender(1 2)
  /MISSING ANALYSIS.

NPAR TESTS
  /m-W=PASI BY Gender(1 2)
  /MISSING ANALYSIS.

 MEANS TABLES=DLQI BY gender
```

```
  /CELLS= COUNT MEDIAN MAX MIN.

MEANS TABLES=PASI BY gender
  /CELLS= COUNT MEDIAN MAX MIN.

NPAR TESTS
  /M-W= PASI BY biologicscount(0 1)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS.

NPAR TESTS
  /M-W= DLQI BY biologicscount(0 1)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS.

MEANS TABLES=PASI DLQI BY biologicscount
  /CELLS= COUNT max min MEDIAN.

NPAR TESTS
  /M-W= PASI BY nonbiologics_current(0 1)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS.

NPAR TESTS
  /M-W= DLQI BY nonbiologics_current(0 1)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS.

MEANS TABLES=PASI DLQi BY nonbiologics_current
  /CELLS=COUNT MEDIAN MIN MAX.
```

```
**binary logistic regression nonbiologics.
NONPAR CORR
/VARIABLES=biologicscount nonbiologics_current PASI DLQI previousbio previousnonbio age_cat
/PRINT=SPEARMAN TWOTAIL NOSIG
/MISSING=PAIRWISE.
*Chile nonbiologics.*hierarchical model.
TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER   previousnonbio
  /METHOD=ENTER  DLQI
  /METHOD=ENTER   PASI
  /METHOD=ENTER age_cat
  /METHOD=ENTER previousbio
  /CONTRAST (previousnonbio)=Indicator(1)
  /CONTRAST (age_cat)=Indicator(1)
  /CONTRAST (previousbio)=Indicator(1)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*raw models.
TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
   /METHOD=ENTER previousnonbio
  /CONTRAST (previousnonbio)=Indicator(1)
   /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

TEMPORARY.
```

```
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER PASI
   /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER age_cat
   /CONTRAST (age_cat)=Indicator(1)
   /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
    /METHOD=ENTER previousbio
   /CONTRAST (previousbio)=Indicator(1)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).


*final model.
TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER  previousnonbio DLQI
  /CONTRAST (previousnonbio)=Indicator(1)
  /SAVE=PRED PGROUP COOK LEVER DFBETA SRESID
  /CLASSPLOT
  /CASEWISE OUTLIER(2)
  /PRINT=GOODFIT ITER(1) CI(95)
```

```
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*Linearity of Logits.
COMPUTE LnDLQI=LN(DLQI).
EXECUTE.

TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER DLQI previousnonbio DLQI*LnDLQI
  /CONTRAST (previousnonbio)=Indicator(1)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*multicolinearity.

TEMPORARY.
SELECT IF country=1.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT nonbiologics_current
  /METHOD=ENTER previousnonbio DLQI.

*Colombia Nonbiologics hierarchical model.
TEMPORARY.
SELECT IF country= 2.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER previousnonbio
```

```
  /METHOD=ENTER DLQI
 /METHOD=ENTER PASI
 /METHOD=ENTER age_cat
  /METHOD=ENTER previousbio
 /CONTRAST (previousbio)=Indicator(1)
 /CONTRAST (previousnonbio)=Indicator(1)
 /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*raw models.
TEMPORARY.
SELECT IF country= 2.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
 /METHOD=ENTER DLQI
 /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country= 2.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
 /METHOD=ENTER previousbio
 /CONTRAST (previousbio)=Indicator(1)
 /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country= 2.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
 /METHOD=ENTER age_cat
  /CONTRAST (previousnonbio)=Indicator(1)
 /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
```

```
SELECT IF country= 2.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER PASI
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).


*final model.
TEMPORARY.
SELECT IF country= 2.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER previousnonbio
  /CONTRAST (previousnonbio)=Indicator(1)
  /SAVE=PRED PGROUP COOK LEVER DFBETA SRESID
  /CLASSPLOT
  /PRINT=GOODFIT ITER(1) CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*collinearity.
TEMPORARY.
SELECT IF country= 2.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT nonbiologics_current
  /METHOD=ENTER previousnonbio.

*Germany nonbiologics hierarchical model
TEMPORARY.
```

```
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER previousbio
   /METHOD=ENTER previousnonbio
  /METHOD=ENTER PASI
  /METHOD=ENTER age_cat
   /METHOD=ENTER DLQI
  /CONTRAST (previousbio)=Indicator(1)
  /CONTRAST (previousnonbio)=Indicator(1)
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*raw models.
TEMPORARY.
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER previousnonbio
  /CONTRAST (previousnonbio )=Indicator(1)
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country=3.
  LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER PASI
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER age cat
   /CONTRAST (age_cat)=Indicator(1)
```

```
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER DLQI
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*final model.
TEMPORARY.
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES nonbiologics_current
  /METHOD=ENTER previousbio
  /CONTRAST (previousbio)=Indicator(1)
  /SAVE=PRED PGROUP COOK LEVER DFBETA SRESID
  /CLASSPLOT
  /CASEWISE OUTLIER(2)
  /PRINT=GOODFIT CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*multico.
TEMPORARY.
SELECT IF country=3.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT nonbiologics_current
  /METHOD=ENTER previousbio.
```

```
*Binary logistic regression Biologics.
*correlation.
*bio chile.
*Hierarchical model.
TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER previousnonbio
  /METHOD=ENTER DLQI
  /METHOD=ENTER  PASI
  /METHOD=ENTER  previousbio
  /METHOD=ENTER age_cat
  /CONTRAST (previousnonbio)=Indicator(1)
  /CONTRAST (age_cat)=Indicator(1)
  /CONTRAST (previousbio)=Indicator(1)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*raw models.
TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES biologicscount
   /METHOD=ENTER DLQI
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES biologicscount
   /METHOD=ENTER PASI
   /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).
```

```
TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER previousbio
   /CONTRAST (previousbio)=Indicator(1)
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES biologicscount
   /METHOD=ENTER age_cat
  /CONTRAST (age_cat)=Indicator
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*final model bio Chile.
TEMPORARY.
SELECT IF country=1.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER previousnonbio DLQI previousbio PASI
  /CONTRAST (previousnonbio)=Indicator(1)
  /CONTRAST (previousbio)=Indicator(1)
  /SAVE=PRED PGROUP COOK LEVER DFBETA ZRESID
  /CLASSPLOT
  /CASEWISE OUTLIER(2)
  /PRINT=GOODFIT ITER(1) CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*Linearity of logits.
```

```
TEMPORARY.
SELECT IF country=1.
  LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER previousnonbio DLQI previousbio PASI LNPASI*PASI
  /CONTRAST (previousnonbio)=Indicator(1)
  /CONTRAST (previousbio)=Indicator(1)
  /SAVE=PRED COOK ZRESID
  /CASEWISE OUTLIER(2)
  /PRINT=GOODFIT ITER(1) CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

* multicollinearity.
TEMPORARY.
SELECT IF country=1.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT biologicscount
  /METHOD=ENTER PASI DLQI previousbio previousnonbio.

*biologics Colombia.
*hierarchical.
TEMPORARY.
SELECT IF country=2.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER DLQI
  /METHOD=ENTER previousnonbio
  /METHOD=ENTER PASI
```

```
  /METHOD=ENTER previousbio
  /METHOD=ENTER age_cat
  /CONTRAST (previousnonbio)=Indicator(1)
  /CONTRAST (previousbio)=Indicator(1)
  /CONTRAST (age_cat)=Indicator
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*raw models.
TEMPORARY.
SELECT IF country=2.
LOGISTIC REGRESSION VARIABLES biologicscount
   /METHOD=ENTER previousnonbio
  /CONTRAST (previousnonbio)=Indicator(1)
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country=2.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER PASI
   /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country=2.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER previousbio
  /CONTRAST (previousbio)=Indicator(1)
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).


TEMPORARY.
```

```
SELECT IF country=2.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER age_cat
  /CONTRAST (age_cat)=Indicator
   /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).
*final model.
TEMPORARY.
SELECT IF country=2.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER DLQI previousnonbio
  /CONTRAST (previousnonbio)=Indicator(1)
  /SAVE=PRED PGROUP COOK LEVER DFBETA ZRESID
  /CLASSPLOT
  /PRINT=GOODFIT ITER(1) CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*linearity of logits.
TEMPORARY.
SELECT IF country=2.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER previousnonbio dlqi_zerotoone dlqi_zerotoone*lnDLQI
  /CONTRAST (previousnonbio)=Indicator(1)
  /PRINT=CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*multicolinearity.
TEMPORARY.
SELECT IF country=2.
REGRESSION
  /MISSING LISTWISE
```

```
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT biologicscount
  /METHOD=ENTER DLQI previousnonbio.


*Germany bio.
*hierarchical.
TEMPORARY.
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER previousnonbio
  /METHOD=ENTER PASI
  /METHOD=ENTER previousbio
  /METHOD=ENTER DLQI
  /METHOD=ENTER age_cat
  /CONTRAST (previousnonbio)=Indicator(1)
  /CONTRAST (previousbio)=Indicator(1)
  /CONTRAST (age_cat)=Indicator(1)
  /CONTRAST (gender_recode)=Indicator(1)
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*crude models.

TEMPORARY.
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER PASI
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).
```

```
 TEMPORARY.
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER previousbio
  /CONTRAST (previousbio)=Indicator(1)
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER DLQI
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

TEMPORARY.
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER age_cat
  /CONTRAST (age_cat)=Indicator(1)
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*final model.

LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER previousnonbio PASI previousbio DLQI age_cat
  /CONTRAST (previousnonbio)=Indicator(1)
  /CONTRAST (previousbio)=Indicator(1)
  /CONTRAST (age_cat)=Indicator(1)
  /SAVE=PRED PGROUP COOK LEVER DFBETA ZRESID
  /CLASSPLOT
```

```
  /PRINT=GOODFIT ITER(1) CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*linearity of logits.

COMPUTE LnPASI=LN(PASI).
EXECUTE.

TEMPORARY.
SELECT IF country=3.
LOGISTIC REGRESSION VARIABLES biologicscount
  /METHOD=ENTER LnPASI*PASI DLQI*LnDLQI PASI DLQI age_cat previousbio previousnonbio
  /CONTRAST (previousbio)=Indicator(1)
  /CONTRAST (previousnonbio)=Indicator(1)
  /CONTRAST (age_cat)=Indicator(1)
  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*COLLINEARITY.
TEMPORARY.
SELECT IF country=3.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT biologicscount
  /METHOD=ENTER PASI DLQI age_cat previousnonbio previousbio.
```

Appendix 5

SPSS output for final regression models

Chile. Non-biologic prescription

Omnibus Tests of Model Coefficients[a]

		Chi-square	df	Sig.
Step 1	Step	33.662	2	.000
	Block	33.662	2	.000
	Model	33.662	2	.000

a. country = Chile

Model Summary[a]

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	73.171[b]	.266	.425

a. country = Chile

b. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test[a]

Step	Chi-square	df	Sig.
1	5.777	8	.672

a. country = Chile

Variables in the Equation[a]

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[b]	previousnonbio(1)	-3.365	.829	16.456	1	.000	.035	.007	.176
	DLQI score	-.132	.055	5.790	1	.016	.876	.787	.976
	Constant	1.663	.876	3.608	1	.057	5.277		

a. country = Chile

b. Variable(s) entered on step 1: previousnonbio, DLQI score.

Colombia: non-biologic prescription

Omnibus Tests of Model Coefficients[a]

		Chi-square	df	Sig.
Step 1	Step	36.111	1	.000
	Block	36.111	1	.000
	Model	36.111	1	.000

a. country = Colombia

Model Summary[a]

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	208.016[b]	.135	.216

a. country = Colombia

b. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test[a]

Step	Chi-square	df	Sig.
1	.000	0	.

a. country = Colombia

Variables in the Equation[a]

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[b]	previousnonbio(1)	-3.498	1.021	11.747	1	.001	.030	.004	.224
	Constant	-.921	.172	28.483	1	.000	.398		

a. country = Colombia

b. Variable(s) entered on step 1: previousnonbio.

Germany: non-biologic prescription

Omnibus Tests of Model Coefficients[a]

		Chi-square	df	Sig.
Step 1	Step	13.082	1	.000
	Block	13.082	1	.000
	Model	13.082	1	.000

a. country = Germany

Model Summary[a]

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	641.111[b]	.026	.036

a. country = Germany

b. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test[a]

Step	Chi-square	df	Sig.
1	.000	0	.

a. country = Germany

Variables in the Equation[a]

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[b]	previousbio(1)	-1.414	.450	9.893	1	.002	.243	.101	.587
	Constant	-.431	.096	20.076	1	.000	.650		

a. country = Germany

b. Variable(s) entered on step 1: previousbio.

Chile: biologic prescription

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	45.114	4	.000
	Block	45.114	4	.000
	Model	45.114	4	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	42.219[a]	.339	.615

a. Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	4.130	8	.845

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	previousnonbio(1)	4.152	1.299	10.224	1	.001	63.570	4.988	810.162
	DLQI score	.315	.104	9.260	1	.002	1.371	1.119	1.679
	previousbio(1)	-7.939	2.209	12.918	1	.000	.000	.000	.027
	PASI score	-.085	.041	4.336	1	.037	.918	.847	.995
	Constant	-1.291	1.393	.859	1	.354	.275		

a. Variable(s) entered on step 1: previousnonbio, DLQI score, previousbio, PASI score.

Colombia: biologic prescription

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	26.996	2	.000
	Block	26.996	2	.000
	Model	26.996	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	78.672[a]	.283	.389

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	5.769	6	.450

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	DLQI score	-.166	.052	9.994	1	.002	.847	.764	.939
	previousnonbio(1)	2.111	.586	12.953	1	.000	8.254	2.615	26.051
	Constant	-.435	.441	.970	1	.325	.647		

a. Variable(s) entered on step 1: DLQI score, previousnonbio.

Germany: biologic prescription

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	115.838	5	.000
	Block	115.838	5	.000
	Model	115.838	5	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	778.631[a]	.160	.216

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	42.308	8	.000

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
Step 1[a]	previousnonbio(1)	1.650	.178	86.098	1	.000	5.207	Lower	Upper
	PASI score	.003	.010	.086	1	.769	1.003	3.675	7.378
	previousbio(1)	.526	.300	3.086	1	.079	1.692	.983	1.024
	DLQI score	.011	.013	.643	1	.423	1.011	.941	3.044
	age_cat(1)	-.436	.280	2.428	1	.119	.647	.985	1.037
	Constant	-1.229	.159	59.591	1	.000	.292	.374	1.119

a. Variable(s) entered on step 1: previousnonbio, PASI score, previousbio, DLQI score, age_cat.