Price comparison of high-cost medicines 2017

Study protocol

Commissioned by the Federal Ministry of Health and Women's Affairs

Gesundheit Österreich GmbH

MINISTERIUM FRAUEN GESUNDHEIT

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Vienna, August 2017

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How to Quote: Vogler, Sabine; Schneider, Peter; Zimmermann, Nina (2017): Price Comparison of High-Cost Medicines 2017. Study protocol. Gesundheit Österreich, Vienna.

No. P4/33/4374

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List of abbreviations

AAHP	Association of Austrian Hospital Pharmacists
AMNOG	Arzneimittelneuordnungsgesetz / Pharmaceutical Market Reorganisation Act (Germany)
AVR	Arzneiverordnungs-Report / Medicines Prescription Report (Germany)
ATC	Anatomical Therapeutic Chemical Code (of the World Health Organization)
BMGF	Bundesministerium für Gesundheit und Frauen / Austrian Federal Ministry of Health and Women's Affairs (Austria)
COPD	Chronic obstructive pulmonary disease
CVD	Cardiovascular disease
DDD	Defined Daily Dosis / Doses
€	Euro
EEC	European Economic Community
EMA	European Medicines Agency
EPR	External Price Referencing
EU	European Union
Euripid	European Integrated Price Information Database
G-BA	Gemeinsamer Bundesausschuss / Joint Federal Committe (Germany)
GDP	Gross Domestic Product
GÖG	Gesundheit Österreich GmbH / Austrian Public Health Institute
HAI	Health Action International
HVB / MASSI	Hauptverband der österreichischen Sozialversicherungsträger / Main Association of Austrian Social Security Institutions
INN	International Non-Proprietary Name
KVP	Kassenverkaufspreis (name of the reimbursement price in Austria)
MEA	Managed Entry Agreement
MS	Member State(s)
Mio.	Million(s)
NEAK	Nemzeti Egészségbiztosítási Alapkezelő / National Health Insurance Fund (Hungary)
OEP	Országos Egészségbiztosítási Pénztár / National Health Insurance Fund (Hungary)

PPI	Pharma-Preisinformation / Pharma Price Information (medicine price information service provided by GÖG)
PPP	Purchasing Power Parities
PRP	Pharmacy Retail Price
UK	United Kingdom
VAT	Value added tax
WHO	World Health Organization

Glossary

Container / (Immediate) Packaging / (Primary) Packaging	A container (or primary/immediate packaging) for pharmaceutical use is an article which holds or is intended to contain and protect a medicine and is or may be in direct contact with it. Primary packaging does not materials used for light protection, transportation or shipment (e.g. cartons)
Content	The content of a medicine indicates the amount of liquid in the pharmaceutical speciality. This of particular interest for pharmaceutical specialities with dosage indications scaled to a standardised denominator (e.g. 50 mg / ml with 0.8 ml)
Discount	A price reduction granted to specified purchasers under specific conditions prior to purchase.
Dosage	The dosage of a medicines indicates the proportion of active ingredient(s), measured in units of volume (e.g. per tablet, per capsule) or concentration. Dosages indications for concentrations could be either scaled to the actual content of the concentration (e.g. 40 mg / 0.8 ml) or to a standardised denominator (e.g. 50 mg / ml)
Ex-factory price	The manufacturer's posted price. Discounts or other incentives offered by manufacturers result in an actual price that is lower than the ex-factory price.
International Non-proprietary name (INN)	The INN is the shortened scientific name based on the active ingredient. It is a unique name that is globally recognised and is public property. WHO is responsible for assigning INNs to pharmaceutical substances.
List price	The prices that purchasers display as the prices at which they are prepared to sell their products and/or regulated by legislation. The prices of products as quoted in the purchaser's price list, catalogue, internet site, advertisements, in a national price list/formulary etc. They are not necessarily actual transaction prices.
Pack size	The pack size of a pharmaceutical speciality is the size used for procurement of item
Pharmaceutical form	Pharmaceutical form is the physical characteristics of the combination of active substance and excipients (non-active ingredients) forming a medicinal product (tablet, liquid, capsule, gel, cream, sprays, etc.).

Pharmaceutical speciality	A medicine in the form in which it is marketed for use with a specific mixture of active ingredients (and inactive ingredients), in a defined pharmaceutical form and apportioned into a particular strength and pack size.
Pharmacy purchasing price	The price charged by wholesalers to community pharmacies. It includes any (statutorily-regulated or negotiated) wholesale remuneration (e.g. margin / mark-up).
Pharmacy retail price	The price charged by community pharmacies to the general public. It includes any pharmacy remuneration such as pharmacy mark or dispensing fee. It can be a gross PRP (including value-added tax/VAT) or a net PRP (excluding VAT)
Price types	The level at which the price of a medicine is set. The following price types exist: • Ex-factory price • Pharmacy purchasing price • Pharmacy retail price
Strength	Pharmaceutical products are defined by several characteristics. The strength of a medicines indicates the amount of active ingredient (in mg) in each pharmaceutical form.

Executive Summary

Gesundheit Österreich GmbH (GÖG) was commissioned by the Austrian Federal Ministry of Health and Women's Affairs to survey and comparatively analyse medicine prices in European countries. The purpose of this research is to focus on medicines in Austria that account for comparatively high expenditure for Austrian public payers. This report presents the methodological design that was developed for the study.

Key elements of the methodology of the 2017 GÖG medicine comparison are as follows:

» *Type of price comparison*: Given the interest of policy-makers on specific medicines that account for high budgetary impact, the study will focus on defined pharmaceutical specialities.

» *Selection of countries*: In line with legal regulations for pricing medicines in Austria (external price referencing), the price study will compare Austrian prices to the ones of all other EU Member States.

» *Selection of medicines*: Based on out-patient reimbursement claims data (January – April 2017) and on an expert pre-selection of medicines by leading hospital pharmacists, pharmaceutical specialities were selected (60 specialities for the out-patient and 40 for the in-patient sector).

» *Price types*: For all pharmaceutical specialities included in the study, ex-factory prices will be analysed. Legal provisions as published in the 'Regulation on Procedural Rules for the Calculation of the EU average price' are applied with regard to countries (Germany, Greece and Spain) that charge statutory manufacturer discounts (i.e. discounted prices will be included), and for the calculation of ex-factory prices in countries without ex-factory price regulation (i.e. average wholesale margins as published in the regulation will be taken as references). In addition, for medicines of the out-patient sector, pharmacy purchasing prices and pharmacy retail prices net and gross will be studied.

» *Data source and timing*: Price information for this study will be retrieved as of September 2017 from the Pharma Price Information (PPI) service maintained by GÖG.

» *Reference pharmaceutical speciality*: The prices of pharmaceutical specialities will be compared on a like-by-like basis, i.e. for the same pharmaceutical form, same strength, same content and same pack. If no data are available for the identical pack size, then the closest pack size or comparable packaging will be used as reference.

» *Unit of analysis*: Price data will be compared on a unit basis (i.e. per tablet, per vial).

» *Exchange rate*: Price data in non-Euro currencies will be converted into Euro based on the monthly average exchange rate published by the European Central Bank.

» *Weighting to account for income*: In addition to the standard price analysis for unweighted data, an additional analysis will be carried out based on price data adjusted by the per capita gross domestic product to account for different income levels of countries.

Comments on the study protocol are welcome and can be sent to pharmanews@goeg.at by Tuesday, 5 September 2017. The use of review template (accessible at www.goeg.at) is highly appreciated.

Kurzfassung

Die Gesundheit Österreich GmbH (GÖG) wurde vom Bundesministerium für Gesundheit und Frauen beauftragt, eine Analyse der Preise kostenintensiver Arzneispezialitäten in Europa durchzuführen. Der Fokus der Analyse sollte hierbei auf jenen Arzneimitteln liegen, welche vergleichsweise hohe Aufwendungen für die öffentlichen Zahler in Österreich verursachen. Der vorliegende Bericht präsentiert den methodischen Ansatz, der für diese Studie entwickelt wurde.

Kernelemente der Methodik des Preisvergleiches 2017 sind:

» *Art des Preisvergleichs*: Da Entscheidungsträger/innen insbesondere Informationen über Arzneimittel benötigen, welche beachtliche budgetäre Auswirkungen haben, wird die Studie in Form eines Einzelpreisvergleichs für definierte Arzneispezialitäten durchgeführt.

» *Länderauswahl*: Gemäß den in Österreich gültigen Regelungen zur Festlegung von Arzneimittelpreisen (EU-Durchschnittspreise), werden die Preise in Österreich mit jenen in den übrigen EU-Mitgliedsländern verglichen.

» *Produktauswahl*: Basierend auf Sozialversicherungsdaten des niedergelassenen Bereichs (Januar-April 2017) und einer Auswahl relevanter Arzneimittel in Krankenanstalten durch den Vorstand der Arbeitsgemeinschaft österreichischer Krankenhausapotheker wurden die Arzneispezialitäten für die Preisstudie 2017 bestimmt (60 Arzneispezialitäten im niedergelassenen und 40 Arzneispezialitäten im Krankenhaussektor).

» *Preisstufe:* Für alle Arzneispezialitäten der Studie werden die Fabriksabgabepreise analysiert. Gemäß der Bestimmungen in der „Regelung für die Vorgehensweise der Preiskommission für die Ermittlung des EU-Durchschnittspreises gemäß § 351c Abs. 6 ASVG“ werden publizierte gesetzliche Herstellerrabatte in Deutschland, Griechenland und Spanien bei der Berechnung berücksichtigt. Für Länder ohne gesetzliche Regulierung der Großhandelsvergütung werden die in der Regelung für die Vorgehensweise der Preiskommission veröffentlichten durchschnittlichen Großhandelsspannen zur Berechnung herangezogen. Bei Arzneispezialitäten aus dem niedergelassenen Bereich werden auch Apothekeneinkaufspreise und Apothekenverkaufspreise (netto und brutto) untersucht.

» *Datenquelle und Zeitraum*: Preisdaten werden mit Stand September 2017 über das Service für Pharma-Preisinformation (PPI) an der GÖG erhoben.

» *Referenz-Arzneispezialität*: Die Preise einzelner Arzneispezialitäten werden mit identischen Arzneispezialitäten (d. h. gleiche Darreichungsform, gleiche Stärke, gleicher Inhalt und gleiche Verpackung) verglichen. Sollte keine Preisinformation zur identischen Arzneispezialität in der gleichen Packungsgröße verfügbar sein, werden die Preise der nächstgrößeren Packung oder der Arzneispezialität in ähnlicher Verpackung herangezogen.

» *Analyseeinheit*: Die Preisdaten werden auf Basis der Stückpreise, d.h. per Abgabeeinheit (Tablette, Kapsel, Durchstechflasche, etc.), verglichen.

» *Wechselkurs*: Preisdaten von Nicht-Euro-Ländern werden anhand der Monatsmittelkurse der Europäischen Zentralbank in Euro umgerechnet.

» *Gewichtung der Preise*: In Ergänzung zu einer Analyse der ungewichteten Preisinformationen (Standard) werden weiters die Preisdaten auch gewichtet nach Wirtschaftskraft der Länder (d.h. anhand des Bruttoinlandsprodukts pro Kopf) untersucht.

Stellungnahmen zur Methodik der Preisstudie 2017 können bis 5. September 2017 an pharmanews@goeg.at übermittelt werden. Es wird gebeten, das dafür vorgesehene Formular (verfügbar unter www.goeg.at) zu verwenden.

1 Introduction

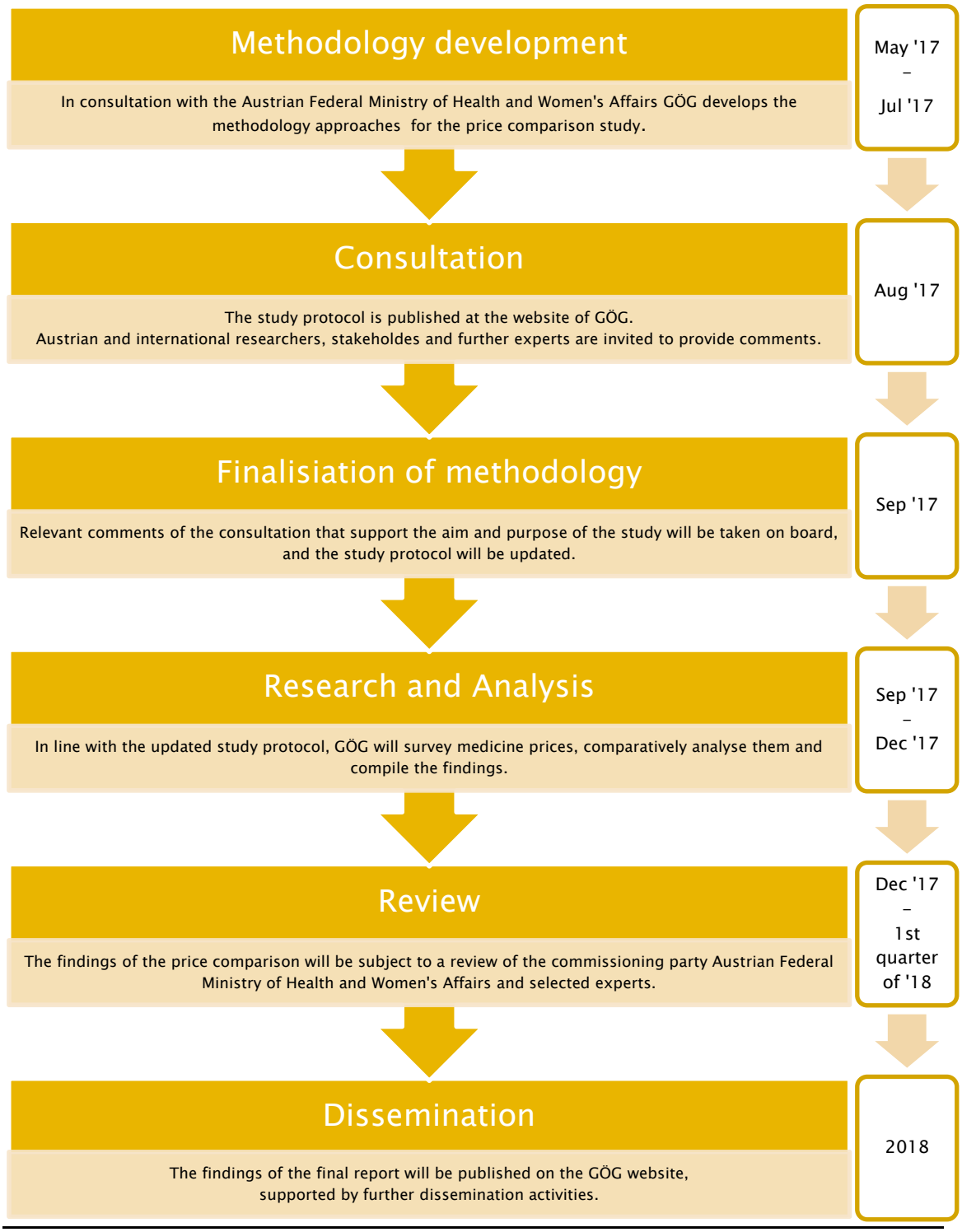
Gesundheit Österreich GmbH (GÖG) is the national research and planning institute for health care and a competence and funding centre of health promotion in Austria. Established on a legal basis (GÖG Law, Federal Collection of Statutes 2006/132) [1], one of GÖG's tasks as established in its foundation law is the performance of international medicine price comparisons and analyses, to support the Austrian Pricing Committee in their setting of the EU average price.

As part of these activities, GÖG has been regularly performing medicine price comparisons. GÖG published European price comparisons for high-cost medicines as of 2013 and 2015 [2, 3]. This market segment had been selected for the previous price studies because some high-cost medicines have been accounting for comparatively large shares of the pharmaceutical budget.

In 2017, GÖG was again commissioned by the Austrian Ministry of Health and Women's Affairs to perform another price comparison of medicines that considerably impact the pharmaceutical bill.

The paper at hand presents the methodological approaches that were developed to perform this study. The findings will be made available in German language. This study protocol, however, is provided in English in order to allow an international review by renowned researchers and further experts in this field. Figure 1.1 presents the planned time-table.

Figure 1.1:
Time-table for the 2017 GÖG price comparison



Source: Gesundheit Österreich GmbH (GÖG)

2 Methods Design

As for any other research question, there is also no 'all-size-fits-all' approach for the performance of price surveys, analyses and comparisons. Depending on the aim and perspective of a study different methodological approaches can be chosen. The methodological choices for this study were guided by the legal basis of GÖG's work for medicines prices, the interest of the commissioning party, and the public health perspective.

In the following, we will present the methodological choices taken for this study, with regard to the following questions:

1. Which type of price comparison will be conducted?
2. Which countries will be included?
3. Which medicines and pharmaceutical specialities will be included?
4. For which price types are selected pharmaceutical specialities compared and how are they made comparable?
5. Where are the data retrieved from, and to which date will they refer to?
6. How are reference pharmaceutical specialities defined, and which approaches are used in case of non-availability of identical specialities?
7. Which unit of analysis is applied?
8. Which approach will be taken to deal with different national currencies?
9. Will different income levels across countries be considered?

These are key questions that have to be decided for any price comparison. Answering these questions may result in different approaches for price comparisons. Several, but not all of them have been addressed in methodology literature about medicine price comparisons [4-9]. Table 5.1 in the Annex shows a matrix of different methodological approaches for price comparisons. Some of the elements are partially interdependent, as reflected in the following sections.

The following sections of Chapter 2 present the methodological decisions taken for the planned price study. Each section is accompanied by theoretical background information about different options, and a justification of the chosen approach. Table 2.1 provides a summary.

Table 2.1:
Summary of the methodological approach taken in the 2017 GÖG price comparison, and their rationale

Issue	Possible options	Choice for this study	Rationale
Type of price comparison	Single medicines comparison Average medicine comparison	Single medicines comparison	Interest of policy-makers on specific medicines, availability of data
Selection of countries	It is recommended that countries included in cross-country comparisons reflect, as far as possible, similarities in the health care and pharmaceutical system, economic wealth, epidemiology, and therapeutic pattern (if data are available). If not, differences can be accounted for through adjustments.	Austria and the remaining 27 European Union Member States (MS) In an alternative scenario, price data will be adjusted by GDP.	Austrian legal provisions for pricing of reimbursable medicines refer to the concept of the average EU price that is based on all other 27 EU MS. EU MS have, in some respect, a high degree of similarity (compared with other regions of the world), and existing economic differences will be accounted for.
Selection of medicines	Total market in a country; Medicines / pharmaceutical specialities that are available in all countries of the survey; Specific groups of medicines (e.g. reimbursable medicines, out-patient medicines, high-priced medicines, orphan medicines, non-prescription medicines, specific indications such as cancer, HIV, diabetes,…).	Selected high-cost medicines from the perspective of Austrian public payers (out-patient and in-patient sectors), i.e. medicines that account for a relatively high-share of the public pharmaceutical bill (due to their price and/or volume), selected on the basis of reimbursement claims data as of the first four months of 2017 (out-patient) and on expert views of a forum of hospital pharmacists (in-patient). In total, 60 pharmaceutical specialities were selected for the out-patient sector and 40 for the in-patient sector.	Policy-makers are accountable for ensuring sustainable funding as a prerequisite for achieving affordable access to medicines for all. As such, monitoring of the price development is key. In line with the principle of prioritization, focus was put on relevant pharmaceutical specialities from the perceptive of policy-makers and public payers. Since high-volume medicines may also have a significant impact on the pharmaceutical bill, these medicines were also included if relevant.
Price types	Price types alongside the supply chain (ex-factory, pharmacy purchasing price (PPP), pharmacy retail price (PRP)); Consideration of taxes and similar (net vs. gross); Consideration of discounts (statutory, confidential) .	Officially published list prices, consideration of the published manufacturer discounts in Germany, Greece and Spain. Analysis of the price data at the level of ex-factory prices for all pharmaceutical specialities of the study, and of PPP, PRP net, PRP gross for the out-patient sector.	While the consideration of all discounts would be highly appreciated, there is non-availability of these data due to confidentiality. Statutory manufacturer discounts are considered for 3 countries as provided for in the legal framework in Austria. For countries without price regulation at the level of wholesale prices, ex-factory prices will be determined based on published average wholesale margins as published in the legal framework in Austria. The analysis of price components of the supply chain is recommended by WHO.

Issue	Possible options	Choice for this study	Rationale
Data source and timing	A few sources for price information are globally available (usually against payment), thereof GÖG has free access to two sources: PPPI and Euripid. Any timing is, in principle, possible.	Source: Pharma Price Information (PPI) service Timing: price data as of September 2017	Based on its legally defined tasks, GÖG has in-house the PPI service that provides independent, up-to-date and reliable price data. PPI can supply price data for all countries of the study. Using September 2017 data, the most up-to-date information will be retrieved.
Reference pharmaceutical speciality	In a single price comparison, the identical pharmaceutical specialities should be compared. Different options could be chosen in case of non-availability of data for the identical speciality, and there are options to allow exceptions – within a certain range – with regard to the pack size and packaging, and also, to some extent, to the pharmaceutical form and strength.	Prices of pharmaceutical specialities will be compared on a like-by-like basis, i.e. per same pharmaceutical form, same strength, same content and same pack size. In case of non-availability of data, the closest pack size or comparable packaging will be taken. In case of non-availability of price data for originator medicines, no prices will be included in the comparison since available price data of the generic versions of the same pharmaceutical speciality will not be considered as a reference.	The selected approach is conservative and reflects cautiousness. While there is the risk of lower data availability, this approach ensures a high degree of comparability. The non-consideration of price data for generic medicines in case of missing data for originator medicines acknowledges the differences in national pricing and reimbursement policies.
Unit of analysis	Different approaches for defining the unit of analysis exist: comparing at the level of pharmaceutical speciality (with major limitations in comparability), defining a common denominator (e.g. unit, DDD, gram) or moving away from prices and determining costs of treatment cycles.	Price data be compared on a unit basis (i.e. per tablet, per vial).	To ensure comparability, there is a need for a common dominator. Choosing unit prices as comparators is a feasible and tested methodology.
Exchange rate	Common options include a conversion based on the exchange rate or purchasing power parities (PPP). The exchange rates could be based on shorter or longer periods, thus reflecting the trade-off between exchange rate volatility and smoothening out longer periods.	Price data in non-Euro currencies will be converted into Euro based on the monthly average exchange rate as reported by the European Central Bank.	An average monthly exchange rate reflects a good balance, and is one of the standard approaches for conversion. In addition, to allow for comparison, a sensitivity analysis will be done by using PPP.
Weighting to account for income	Weighting of price data by the per capita gross domestic product (GDP) acknowledges the different income level of countries.	In an add-on analysis, the price data will be adjusted based on the per capita GDP to account for the income levels of countries.	The standard analysis will be done for unweighted data, in line with the legal provisions for pricing in Austria. However, to consider differences in purchasing power and ability-to-pay of countries, this alternative scenario will be investigated.

Source: Gesundheit Österreich GmbH (GÖG)

2.1 Type of price comparison

To account for the interest of policy-makers, this price study compares prices of individual pharmaceutical specialities instead of calculating average prices for groups of medicines.

Theoretical background

In literature two different types of comparisons for medicine prices can be found: (1) comparisons of prices of one (or more) product(s) [5, 10, 11], and (2) comparisons of average prices [12–14]. The first approach that investigates individual products is also applied in the pricing policy known as '*External Price Referencing*' (EPR).[1] The second approach considers prices at a macro perspective by calculating average prices for groups of medicines. Possible groupings include clustering at ATC 4 level or sub-markets.

Both approaches have their benefits and limitations. Medicines included in a single price comparison might be of particular interest for study authors and/or their commissioning bodies. For instance, public payers might want to have an investigation of those medicines that they account for a growing fraction of public pharmaceutical expenditure. In Germany, the medicines with the highest expenditure for public payers accounted for 8.3 billion Euro in 2015. This is around a quarter of all public pharmaceutical expenditure. Particularly, on-patent medicines have been identified as the main driver of pharmaceutical expenditures, as their share in value of the pharmaceutical markets has increased in the last 20 years from 24 percent in 1996 to 45 percent in 2015. [17]. While the single price comparison informs about the price for selected medicines, it usually is not representative for the entire market. Average price comparisons may ease the effect of outliers that might have a rather strong impact in rather small samples [18]. Weighting by volume reflects the relevance of the utilisation of the medicines included in the analysis. Depending on the research perspective, weights of prices can be either volume information in a foreign country or volume information in the own country [12]. Average price comparisons that use indices (e.g. Laspeyres or Fisher Index) can also be used to identify the drivers of pharmaceutical expenditures [19, 20] (cf. also section 2.9).

As stated above, the choice of the type of price comparison importantly depends on the perspective of the researchers and/or commissioning party whether, or not, they are interested in prices of defined medicines or rather in an overview of a sub-market. Another determinant for the choice about the type of price comparison is data availability issues: for average price comparisons price data of a large number of medicines are required – ideally supplemented by volume data or market share – to allow for appropriate weighting. Price studies that conduct average price comparisons usually use price and/or volume information provided either by the respective national authorities

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1 EPR is the practice of using the price(s) of a medicine in one or several countries in order to derive a benchmark for setting or negotiating maximum prices [15]. International price comparisons for the purpose of EPR provide inputs which are used during the process of determining pharmaceutical prices [16].

[21, 22] or a commercial provider of the data [23, 24]. A price comparison of individual pharmaceutical specialities requires price information of the respective speciality, and is considered by WHO/HAI as the more robust method for making international comparisons, because constructing indices requires different methods and further reliable data [7]

Decision on methodological approach for this study

GÖG was commissioned by the Austrian Federal Ministry of Health and Women's Affairs to investigate the prices of selected medicines that account for high public expenditure in Austria.

2.2 Selection of countries

In the study, Austrian medicine prices are compared to the ones of the other 27 European Union (EU) Member States. This geographic scope reflects the legal provisions in Austria that prices of these countries are considered in the price setting based on the EU average price.

Theoretical background

When making international price comparisons of pharmaceuticals, the selection of countries is not as straightforward as it may seem and deciding on the scope of countries can be very challenging. The countries in the analysis should be similar in terms of economic wealth and development. They should be similar in population size and have similar health structures and medicine utilisation patterns. However, these requirements are difficult to meet as even homogenous groups of countries such as the Scandinavian countries show differences among therapeutic traditions for treating various conditions [4]. The choice of countries for comparisons depends on the purpose of the comparisons. A comparison of the EU Member States that are heterogeneous in different aspects can carry powerful messages e.g. to show that pharmaceutical prices show fewer variation than it would be expected from the variation in national per capita income [25]. In particular the price variation is significantly lower for on-patent medicines [14].

With regard to the selection of countries, the WHO Guideline on Country Pharmaceutical Pricing Policies states that the selection of comparator countries is crucial when international price comparisons are used for the purpose of determining pharmaceutical prices. When selecting countries it is suggested considering, among others[2]:, the following aspects: (1) the comparability of the medicine regulatory system, respectively pharmaceutical pricing regulations, (2) access to price information and date of the available price e.g. current price vs. launch price, (3) the price level and procedures to adjust if information at this price level is not available [26].

2

The guideline mentions three further aspects but those are rather linked to the policy dimension of international price comparisons: (1) the formula that is used determine the benchmark price (e.g. minimum price of set of reference countries; (2) adequate staff to compile and analyse data, and (3) procedures to ensure that ERP feeds into the decision-making process.

The practice of comparing prices between countries implicitly assumes that they are sufficiently comparable. Still, it has to be acknowledged that countries will continue to differ in several aspects, and medicine utilisation can be influenced by many factors (e.g. religion, culture, geography, clinical guidelines) [19, 27]. Usually, pharmaceutical prices of neighbouring countries or countries in the same region with similar economic indicators are deemed to be comparable [6]. As stated above, a comparison of countries with different levels of income is possible and can be done if it contributes to the research question or to convey a message[7]. Among European countries there is a tendency rather to compare prices with countries that share economic similarities or geographical proximity, especially when price comparisons are intended to serve as input for EPR [26].

Decision on methodological approach for this study

In Austria, medicines included in the out-patient reimbursement list ('Erstattungskodex') have to be priced at or below the average price, as established by the Pricing Committee. The Pricing Committee considers data of all EU Member States (except Austria) and calculates the arithmetic average of the prices in the countries in which the medicine is available on the market [28]. In line with the legal provisions for the Pricing Committee, this price study will include all (current) 28 EU Member States and will compare Austrian prices to the prices of the remaining EU Member States.

Overall, the EU Member States have similar health care systems, based on either a national health service or a social health insurance system. Marketing authorisation is harmonised within the EU: several of the medicines aimed to be included for this study (scope: high-cost medicines, cf. section 2.3) were authorised through the EMA centralised procedure, others during mutual recognition procedure. As a result, no differences in availability of the medicines selected would be caused by the regulatory processes (still, differences in availability can exist as pharmaceutical companies may delay market entry for certain medicines in some countries).

Though pharmaceutical pricing and reimbursement is a national competence, some principles with regard to procedures are applied in all EU Member States in accordance with the EU Transparency Directive [29].

While there are high similarities in the economic situation of several of the countries included, there are weaker economies, particularly in Central and Eastern Europe, compared to Austria. According to the most recent (July 2017) classification of the World Bank [30], Bulgaria, Croatia and Romania are upper-middle income countries, the remaining EU Member States are classified as high-income countries. Overall, the GDP per capita expressed in Euro Purchasing Power Parities (PPP) (2016 or latest available year) ranged between 77.400 (Luxembourg) and 17.200 (Romania); The EU 28 average is Euro PPP 29,000, while the EU 15 average (i.e. countries that joined the EU before 2004) is Euro PPP 31,400 [31].

In order to account for the variation in the economic situation of the included countries, price data surveyed will be adjusted by GDP per capita expressed in PPP (cf. section 2.9).

2.3 Selection of products

Pharmaceutical specialities investigated will be selected in terms of their budgetary relevance for public payers and providers (i.e. hospitals).

International evidence

Independent of whether the chosen approach is an investigation of prices of individual medicines or a study of averages of a group of medicines, the price comparison can be performed for the entire market, or for defined sub-markets. For instance, several price studies have been performed for reimbursement markets (or out-patient reimbursement markets), i.e. medicines that are, at least partially, funded by (out-patient) payers [12, 32]. In Germany, the so-called 'Arzneiverordnungs-Report' (AVR) has been annually published for more than 30 years and contains an analysis of medicines prescribed and dispensed at the expense of public payers. A part of this analysis is a comparison of prices with one other EU country like Sweden [33] or a group of reference countries [5]. Another approach could be to select medicines that account for highest sales or highest expenditure for public payers or patient) [34, 35]. Given the emergence of high-priced medicines in recent years [36-38], some studies have been performed for such medicines [39-41], whereas some surveys particularly focused on orphan medicinal products. Price studies are available for medicines of specific indications (e.g. cancer, HIV diabetes, asthma/COPD, CVD) [42-44].

In addition, some price surveys and comparisons particularly looked at the prices of generics [18, 45-48]. There are rather few price studies related to non-prescription medicines [49]. A possible explanation for the rarity of these price studies is the fact that non-prescription medicines tend to be not price-regulated in most countries, and price data are often not available [50]. In the European Union, EUROSTAT is responsible for calculating Purchasing Power Parities (PPP) for consumer goods including pharmaceuticals. The selection of medicines for calculating PPP aims to be representative. 150 to 200 products were specified and sent to participating countries that were required to select at least 50 which reflect the share of originator and generic products in the sales data [51]. The last EUROSTAT survey on price level indices for pharmaceutical products was rather broad and included prices of (partially) publicly financed medicines that are usually dispensed on a prescription [14].

As the multiple use of the above-mentioned references highlights, there are overlaps in the scope of the price studies related to the groups of medicines.

The focus of these studies differs. Some studies are limited to few medicines, or include only a limited number of countries. Studies based on the WHO/HAI methods usually surveyed medicines from the global and regional 'core lists' that had been introduced to standardise WHO/HAI surveys and enable international comparison of medicine prices, availability and affordability. The medicines on those lists were selected with regard to (a) the burden of the diseases they are treating, (2) the available evidence on effectiveness and efficiency, (3) availability in standard formulations, and (4) the medicine's importance. The global core list consisted of 14 medicines that are included

in all medicine prices surveys, while the regional core list[3] included 16 medicines that account for regional differences in medicine usage [7].

Specifications and background on the Austrian reimbursement market

GÖG was asked to perform a price study that investigates the prices of medicines that account for a comparably high share of expenditure for the public payers.

The organisational and funding framework for medicines in Austria is as follows:

» **Out-patient sector:** The Main Association of Austrian Social Security Institutions (MASSI) is the main public payer of medicines in the out-patient sector. In 2015, pharmaceutical expenditures in the out-patient sector accounted for 3.387 billion Euro of which 88% were financed by public health insurance institutions [53].
» **In-patient sector:** In Austria's in-patient sector, cost for medicines are included in the DRG lump sum system. This makes it difficult to determine pharmaceutical expenditure, but a recent unpublished study estimated pharmaceutical expenditure in the in-patient sector around 1.01 billion Euro [54]. Since no out-of pocket payments for medicines are required in the in-patient sector, this amount equals the expenditures for public payers.

Decision on methodological approach for this study

GÖG was commissioned by the Austrian Ministry of Health and Women's Affairs to include high-cost medicines (from an Austrian perspective) into the study. High-cost medicines are defined as those pharmaceutical specialities (i.e. medicines in a defined pharmaceutical form, strength and pack size) that account for a comparably high share of pharmaceutical expenditure covered by public payers.

The focus on these medicines results from the obligation of competent authorities and public payers to ensure affordable access to medicines to all patients [55-57]. To do so, sustainable funding of health systems is one key element identified by the WHO [58] and has been implemented in national medicines policy [59, 60]. Therefore, monitoring of the development of medicine prices is an important instrument. In line with the principle of prioritization[4], relevant pharmaceutical specialities from the perceptive of policy-makers and public payers were selected for this study.

3
In the 2016's update to the manual, the regional lists have been removed. Instead it is recommended to survey 50 medicines of which 14 medicines are taken form the global core lost and 36 are chosen by the national investigator [52].

4
In materials management, the so-called ABC analysis is a technique for inventory categorisation and prioritisation. Products are classified into three categories, A, B and C. For A items there should be very tight controls and accurate records, while the controls can become less tightly for each category. The main criterion for classifying goods is how much they account for a large proportion of the overall value. A items typically account for 70-80% of the value of the items within a defined period of time.

Medicines from both out-patient and in-patient sectors will be included in order to reflect an integrated approach. According to unpublished GÖG estimation, pharmaceutical expenditure is estimated to be divided between the out-patient and in-patient sectors on a 80% to 20% basis. As a result, the share of medicines relevant for the in-patient sector will be represented in an accordingly lower percentage. GÖG plans to survey a sample of around 100 pharmaceutical specialities[5], and thus not more than 40 products might be attributable to the hospital sector.[6]

The term 'high-cost medicines' is frequently used as a synonym for 'high-priced medicines'. As the above-mentioned definition indicated, this is not the case for this study. In addition to high-priced medicines, some high-volume medicines if they significantly affect the pharmaceutical bill were also included if relevant.

Since the study aims to provide the most up-dated picture, the most recently available data were taken into consideration.

The selection of the medicines was based on the following principles: We included pharmaceutical specialities that were among top ranked in the lists provided by MASSI and AAHP. This approach (i.e. not taking the 'top medicines', but those that were among the 'top medicines') was selected in order to allow the inclusion of a few further high-cost medicines that could be of particular relevance for policy makers. In addition, this approach enabled the inclusion of pharmaceutical specialities that had also been covered in previous GÖG price surveys in order to allow possible analyses over time. In several cases more pharmaceutical specialities of a medicine (e.g. a pre-filled syringe and a pre-filled pen) ranked under the top medicines. As the price comparisons will be done on a like-by-like basis (c.f. section 2.6), pharmaceutical specialities with the same active ingredient were included in the analysis.

5

This number results from available resources for the survey and analysis. This is higher than in most single price comparison studies and aims to reflect a sufficient share in public expenditure.

6

Given the budget impact of some high-priced medicines (frequently used in hospital settings [40]), a higher proportion of medicines of the hospital sector compared to its share in terms of pharmaceutical expenditure was decided to be included in the study.

Figure 2.1:
Flow chart of the product selection for 2017 GÖG price comparison

Source: Gesundheit Österreich GmbH (GÖG)

Based on these principles, the following approaches were taken to select the pharmaceutical specialities to be included in the survey:

» **Out-patient sector:** The medicines' selection was guided by data provided by the Main Association of Austrian Social Security Institutions (MASSI) about 100 pharmaceutical specialities that accounted for highest expenditure for MASSI. In line with the above-mentioned principles, GÖG selected 60 pharmaceutical specialities out of the list of the list related to the first four months as of 2017. Out of the 60 pharmaceutical specialities, 12 are included in the green box and can be prescribed at the expense of public payer by any contract doctor. The majority of the selected pharmaceutical specialities were included in the yellow box, which requires either an ex-ante approval of a sickness fund head 'head-physician' ('dark-yellow') or a documentation by the prescribing doctor in the case of ex-post volume control ('light yellow'). Two selected pharmaceutical specialities are from the red box which includes those medicines for which a decision on reimbursement is pending, and seven medicines do not qualify for general reimbursement, but are reimbursed on an individual basis. 45 medicines were authorised through centralised EMA procedures. Among the selected 60 pharmaceutical specialities some have the same active ingredient and differ in strength, pharmaceutical form or pack size. As will be explained in section 2.6 pharmaceutical specialities will be compared separately. The list of selected pharmaceutical specialities for the out-patient sector is displayed in Table 2.2.

» **In-patient sector**: In Austria, there is no coordinated list that informs about the high-cost medicines in the in-patient sector. Thus, the support of the Austrian Association of Hospital Pharmacists (ARGE Krankenhausapotheker) was sought. The Board of AAHP provided a list of 40 pharmaceutical specialities that they considered, after an internal consolidated consultation process, as relevant for the research question. In establishing a list, the hospital pharmacists considered the 15 medicines / pharmaceutical specialities that had been included in the previous GÖG price study on 2015 prices [2]. Based on the list provided by the hospital pharmacists, GÖG chose 40 pharmaceutical specialities for the analysis of the hospital sector. The list can be found in Table 2.3. As for the out-patient sector, GÖG might decide to take some slight changes in the list if well-substantiated suggestions will be raised during the review process.

The information provided by MASSI and AAHP was re-structured according to the classification system used by EMA.

Table 2.2:
List of 60 pharmaceutical specialities that account for high expenditure for the public payer in the out-patient sector (based on out-patient reimbursement claims data for January – April 2017), by alphabetical order

Active Ingredient	Brand name	ATC code	EMA code / national code	Strength	Content	Pharmaceutical form	Pack size	Packaging
Abacavir / Dolutegravir / Lamivudin	Triumeq®	J05AR	EU/1/14/940/001	50 mg / 600 mg / 300 mg		film-coated tablet	30	tablets in a bottle
Abirateronacetat	Zytiga®	L02BX	EU/1/11/714/001	250 mg		tablet	120	tablets in bottle
Adalimumab	Humira®	L04AB04	EU/1/03/256/003	40 mg	0.8 ml	solution for injection	2	pre-filled syringe
Adalimumab	Humira®	L04AB04	EU/1/03/256/008	40 mg	0.8 ml	solution for injection	2	pre-filled pen
Apixaban	Eliquies®	B01AF02	EU/1/11/691/001	2.5 mg		film-coated tablet	60	tablets in a blister
Apixaban	Eliquies®	B01AF02	EU/1/11/691/009	5 mg		film-coated tablet	60[6]	tablets in a blister
Apixaban	Eliquies®	B01AF02	EU/1/11/691/001	2.5 mg		film-coated tablet	60	tablets in a blister
Apremilast	Otezla®	L04AA32	EU/1/14/981/002	30 mg		film-coated tablet	56	tablets in a blister
Dabigatranetexilat	Pradaxa®	B01AE07	EU/1/08/442/008	110 mg		capsule, hard	30	capsules in a blister[5]
Dabigatranetexilat	Pradaxa®	B01AE07	EU/1/08/442/011	150 mg		capsule, hard	60	capsules in a blister[5]
Denosumab	Prolia®	M05BX04	EU/1/10/618/003	60 mg	1 ml	solution for injection	1	pre-filled syringe
Denosumab	Xgeva®	M05BX04	EU/1/11/703/001	120 mg	1.7 ml	solution for injection	1	vial (glass)
Dimethylfumarat	Tecfidera®	N07XX09	EU/1/13/837/002	240 mg		capsule, hard	56	capsules in a blister
Diosmin Combinations	Daflon®	C05CA53	1-20685	500 mg		film-coated tablet	30	tablets in a blister
Dolutegravir	Tivicay®	J05AX12	EU/1/13/892/001	50 mg		film-coated tablet	30	tablets in a bottle
Elbasvir/Grazoprevir	Zepatier®	J05A	EU/1/16/1119/001	50 mg / 100 mg		film-coated tablet	28	tablets in a blister
Emtricitabine / Tenofovir disoproxil	Truvada®	J05AR03	EU/1/04/305/001	200 mg / 245 mg		Film-coated tablet	30	tablets in a bottle
Enoxaparin	Lovenox®	B01AB05	1-18662	40 mg	0,4 ml	solution for injection	10	pre-filled syringe
Enzalutamid	Xtandi®	L02BB04	EU/1/13/846/001	40 mg		capsule, soft	112	capsules in a blister
Etanercept	Enbrel®	L04AB01	EU/1/99/126/017	50 mg	1 ml	solution for injection	4	pre-filled syringe
Etanercept	Enbrel®	L04AB01	EU/1/99/126/020	50 mg	1 ml	solution for injection	4	pre-filled pen
Ezetimib	Ezetrol®	C10AX09	1-24902	10 mg		tablet	30[6]	tablets in a blister
Fenoterol / Ipratropium-bromid	Berodual®	R03AL01	1-16995	50 mcg / 20 mcg	200 do-ses	inhalation solution	1	pressurised inhaler
Fingolimod	Gilenya®	L04AA	EU/1/11/677/005	0.5 mg		capsule, hard	28	capsules in a blister[1]

Active Ingredient	Brand name	ATC code	EMA code / national code	Strength	Content	Pharmaceutical form	Pack size	Packaging
Formoterol/Beclometa-sone	Foster®	R03AK08	1-27002	100 mcg / 6 mcg	120 doses	inhalation solution	1	pressurised inhaler
Formoterol/Budesonid	Symbicort®	R03AK07	1-23993	160 mcg / 4.5 mcg	120 doses	inhalation powder	1	inhaler
Glatiramer Acetat	Copaxone®	L03AX13	1-35998	40 mg	1 ml	solution for injection	12	pre-filled syringe
Golimumab	Simponi®	L04AB06	EU/1/09/546/001	50 mg	0.5 ml	solution for injection	1	pre-filled pen
Golimumab	Simponi®	L04AB06	EU/1/09/546/003	50 mg	0.5 ml	solution for injection	1	pre-filled syringe
Ibrutinib	Imbruvica®	L01XE	EU/1/14/945/002	140 mg		capsule, hard	120	capsules in a bottle
Imatinib	Glivec®	L01XE01	EU/1/01/198/010	400 mg		film-coated tablet	30	tablets in a blister
Infliximab	Remicade®	L04AB02	EU/1/99/116/003	100 mg		Powder for concen-trate for solution for infusion	3	vial (glass)
Insulin aspart	NovoRapid®	A10AB05	EU/1/99/119/003	100 U/ml	3 ml	solution for injection	5	Cartridge (glass)[7]
Ivacaftor / Lumacaftor	Orkambi®	R07AX30	EU/1/15/1059/001	200 mg / 125 mg		film-coated tablet	112	tablets in a blister
Ledipasvir / Sofosbuvir	Harvoni®		EU/1/14/958/001	90 mg / 400 mg		film-coated tablet	28	tablets in a botte
Lenalidomid	Revlimid®	L04AX04	EU/1/07/391/002	10 mg		capsule, hard	21	capsules in a blister
Lenalidomid	Revlimid®	L04AX04	EU/1/07/391/004	25 mg		capsule, hard	21	capsules in a blister
Lenalidomid	Revlimid®	L04AX04	EU/1/07/391/003	15 mg		capsule, hard	21	capsules in a blister
Linagliptin	Trajenta®	A10BH05	EU/1/11/707/004	5 mg		film-coated tablet	30[6]	tablets in a blister
Macitentan	Opsumit®	C02KX04	EU/1/13/893/002	10 mg		film-coated tablet	30	tablets in a blister[2]
Metformin / Sitagliptin	Janumet®	A10BD07	EU/1/08/455/010	50 mg / 1000 mg		film-coated tablet	56[6]	capsules in a blister
Metformin / Vildagliptin	Eucreas®	A10BD08	EU/1/07/425/009	50 mg / 1000 mg		film-coated tablet	60	tablets in a blister[4]
Olodaterol / Tiotropium Bromid	Spiolto®	R03AL06	1-36299	2,5 mcg / 2,5 mcg	60 doses	Inhalation solution	1	pressurised inhaler
Omalizumab	Xolair®	R03DX05	EU/1/05/319/008	150 mg	1 ml	solution for injection	1	pre-filled syringe
Ombitasvir/ Paritapre-vir/Rionavir	Viekirax®	J05AX67	EU/1/14/982/001	12.5 mg / 75 mg / 50 mg		film-coated tablet	56	tablets in a blister
Palbocilib	Ibrance®	L01XE33	EU/1/16/1147/005	125 mg		capsule, hard	21	capsules in a blister[2]
Pegfilgrastim	Neulasta®	L03AA13	EU/1/02/227/004	6 mg	0.6 ml	solution for injection	1	pre-filled syringe
Rilmenidin	Iterium®	C02AC06	1-23813	1 mg		tablet	30	tablets in a blister

Active Ingredient	Brand name	ATC code	EMA code / national code	Strength	Content	Pharmaceutical form	Pack size	Packaging
Rivaroxaban	Xarelto®	B01AF01	EU/1/08/472/012	15 mg		film-coated tablet	28	tablets in a blister
Rivaroxaban	Xarelto®	B01AF01	EU/1/08/472/013	15 mg		film-coated tablet	42	tablets in a blister
Rivaroxaban	Xarelto®	B01AF01	EU/1/08/472/018	20 mg		film-coated tablet	28	tablets in a blister
Rosuvastatin	Crestor®	C10AA07	1-24883	10 mg		film-coated tablet	30[6]	tablets in a blister
Rosuvastatin	Crestor®	C10AA07	1-24883	20 mg		film-coated tablet	30[6]	tablets in a blister
Secukinumab	Cosentyx®	L04AC10	EU/1/14/980/005	150 mg	1 ml	solution for injection	2	pre-filled pens
Sofosbuvir/Velpatasvir	Epclusa®	J05A	EU/1/16/1116/001	400 mg 100 mg		film-coated tablet	28	tablets in a bottle
Tiotropium Bromid	Spiriva®	R03BB04	1-24507	18 mcg		inhalation powder	30	capsules[3]
Tiotropium Bromid	Spiriva®	R03BB04	1-27222	2.5 mcg	60 doses	inhalation solution	1	inhaler
Tocilizumab	Roactemra®	L04AC07	EU/1/08/492/007	162 mg	0.9 ml	solution for injection	4	pre-filled syringe
Trazodon	Trittico®	N06AX05	1-23301	150 mg		retard tablets	60	tablets in a blister
Treprostinil	Remodulin®	B01AC21	1-26523	10 mg/ml	20 ml	solution for infusion	20	vial (glass)
Ustekinumab	Stelara®	L04AC05	EU/1/08/494/003	45 mg	0.5 ml	solution for injection	1	pre-filled syringe

[1] Authorised presentations of this medicine which are considered equal for price comparison: (1) blister-wallet, (2) blister-cartoon
[2] Authorised presentations of this medicine which are considered equal for price comparison: (1) capsules/tablets in blister, (2) capsules/tablets in a bottle
[3] Authorised presentations of this medicine which are considered equal for price comparison: (1) capsules (2) capsules with inhaler
[4] Authorised presentations of this medicine which are considered equal for price comparison: (1) Blister (PA/Alu/PVC/Alu), (2) Blister (PCTFE/PVC/Alu)
[5] Authorised presentations of this medicine which are considered equal for price comparison: (1) blister (Alu/Alu), (2) bottle (PP), (3) white blister (Alu/Alu))
[6] Different pack sizes of this medicine are authorised and could be considered in the case of non-availability of price information
[7] Authorised presentations of this medicine which are considered equal for price comparison: (1) cartridge (glass), (2) Cartridge (glass) in a pre-filled pen

Source: Hauptverband der österreichischen Sozialversicherungsträger (HVB), Presentation: Gesundheit Österreich GmbH

Table 2.3:
List of 40 pharmaceutical specialities of high budgetary relevance in the in-patient sector, by alphabetical order

Active Ingredient	Brand name	ATC code	EMA code / national code	Strength	Content	Pharmaceutical form	Pack size	Packaging
Aflibercept	Eylea®	S01LA	EU/1/12/797/002	40 mg/ml	0.1 ml	Solution for injection	1	Vial (glass)[1]
Alemtuzumab	Lemtrada®	L04AA	EU/1/13/869/001	12 mg	1.2 ml	Concentrate for solution for infusion	1	Vial
Alglucosidase Alfa	Myozyme®	A16AB07	EU/1/06/333/002	50 mg	20 ml	Powder for concentrate for solution for infusion	1	Vial
Anidulafungin	Ecalta®	J02AX06	EU/1/07/416/002	100 mg	30 ml	Powder for concentrate for solution for infusion	1	Vial
Azacitidin	Vidaza®	L01BC07	EU/1/08/488/001	25 mg/ml	100 mg	Powder for suspension for injection	1	Vial
Bevacizumab	Avastin®	L01XC07	EU/1/04/300/001	25 mg/ml	4 ml	Concentrate for solution for infusion	1	Vial
Bevacizumab	Avastin®	L01XC07	EU/1/04/300/002	25 mg/ml	16 ml	Concentrate for solution for infusion	1	Vial
Carfilzomib	Kyprolis®	L01XX45	EU/1/15/1060/001	60 mg	30 ml	Powder for solution for infusion	1	Vial
Carfilzomib	Kyprolis®	L01XX45	EU/1/15/1060/002	10 mg	5 ml	Powder for solution for infusion	1	Vial
Carfilzomib	Kyprolis®	L01XX45	EU/1/15/1060/003	30 mg	15 ml	Powder for solution for infusion	1	Vial
Cetuximab	Erbitux®	L01XC06	EU/1/04/281/003	5 mg/ml	20 ml	Solution for infusion	1	Vial
Cetuximab	Erbitux®	L01XC06	EU/1/04/281/005	5 mg/ml	100 ml	Solution for infusion	1	Vial
Daratumumab	Darzalex®	L01XC24	EU/1/16/1101/001	20 mg/ml	5 ml	Concentrate for solution for infusion	1	Vial
Daratumumab	Darzalex®	L01XC24	EU/1/16/1101/002	20 mg/ml	20 ml	Concentrate for solution for infusion	1	Vial
Defibrotid	Defitelio®	B01AX01	EU/1/13/878/001	80 mg/ml	2.5 ml	Concentrate for solution for infusion	10	Vial
Dexmedetomidin	Dexdor®	N05CM18	EU/1/11/718/001	100 mcg/ml	2 ml	Concentrate for solution for infusion	5	Ampoules (glass)[2]

Active Ingredient	Brand name	ATC code	EMA code / national code	Strength	Content	Pharmaceutical form	Pack size	Packaging
Dexmedetomidin	Dexcor®	N05CM18	EU/1/11/718/002	100 mcg/ml	2 ml	Concentrate for solution for infusion	25	Ampoules (glass)
Dexmedetomidin	Dexdor®	N05CM18	EU/1/11/718/004	100 mcg/ml	4 ml	Concentrate for solution for infusion	4	Vial
Dexmedetomidin	Dexdor®	N05CM18	EU/1/11/718/006	100 mcg/ml	10 ml	Concentrate for solution for infusion	4	Vial
Doxorubicin	Myocet®	L01DB01	EU/1/00/141/001	50 mg	50 mg / 1.9 ml / 3 ml	Powder, dispersion and solvent for concentrate for dispersion for infusion	2	Sets of 3 vials
Eculizumab	Soliris®	L04AA25	EU/1/07/393/001	300 mg	30 ml	Concentrate for solution for infusion	1	Vial
Filgrastim	Lonquex®	L03AA14	EU/1/13/856/002	6 mg	0.6 ml	Solution for injection	1	Pre-filled syringe[3]
Idursulfase	Elaprase	A16AB09	EU/1/06/365/001	2 mg/ml	3 ml	Concentrate for solution for infusion	1	vial
Ipilimumab	Yervoy®	L01XC11	EU/1/11/698/001	5 mg/ml	10 ml	Concentrate for solution for infusion	1	Vial (glass)
Ipilimumab	Yervoy®	L01XC11	EU/1/11/698/002	5 mg/ml	40 ml	Concentrate for solution for infusion	1	Vial (glass)
Levosimendan	Simdax®	C01CX08	1-24093	2.5 mg/ml	5 ml	Concentrate for solution for infusion	1	vial (glass)
Micafungin	Keytruda®	J02AX05	EU/1/08/448/001	50 mg	10 ml	Powder for solution for infusion	1	Vial (glass)
Micafungin	Keytruda®	J02AX05	EU/1/08/448/002	100 mg	10 ml	Powder for solution for infusion	1	Vial (glass)
Nivolumab	Opdivo®	L01XC17	EU/1/15/1014/001	10 mg/ml	4 ml	Concentrate for solution for infusion	1	Vial (glass)
Nivolumab	Opdivo®	L01XC17	EU/1/15/1014/002	10 mg/ml	10 ml	Concentrate for solution for infusion	1	Vial (glass)
Pembrolizumab	Keytruda®	L01XC18	EU/1/15/1024/001	50 mg		Powder for concentrate for solution for infusion	1	Vial (glass)
Pembrolizumab	Keytruda®	L01XC18	EU/1/15/1024/002	25 mg/ml	4 ml	Concentrate for solution for infusion	1	Vial (glass)

Active Ingredient	Brand name	ATC code	EMA code / national code	Strength	Content	Pharmaceutical form	Pack size	Packaging
Pertuzumab	Perjeta®	L01XC13	EU/1/13/813/001	420 mg		Concentrate for solution for infusion	1	Vial (glass)
Posaconazol	Noxafil®	J02AC04	EU/1/05/320/002	100 mg		Gastro-resistant tablet	24	Tablets in a blister
Posaconazol	Noxafil®	J02AC04	EU/1/05/320/003	100 mg		Gastro-resistant tablet	96	Tablets in a blister
Rituximab	Mabthera®	L01XC02	EU/1/98/067/001	100 mg	10 ml	Concentrate for solution for infusion	2	Vial
Trastuzumab	Herceptin®	L01XC03	EU/1/00/145/001	150 mg	150 mg	Powder for concentrate for solution for infusion	1	Vial
Trastuzumab	Herceptin®	L01XC03	EU/1/00/145/002	150 mg/ml	5 ml	Solution for injection	1	Vial
Trastuzumab	Kadcyla®	L01XC14	EU/1/13/885/001	100 mg	100 mg	Powder for concentrate for solution for infusion	1	Vial
Trastuzumab	Kadcyla®	L01XC14	EU/1/13/885/002	160 mg	160 mg	Powder for concentrate for solution for infusion	1	Vial

[1] Authorised presentations of this medicine which are considered equal for price comparison: (1) pre-filled syringe (glass), (2) vial (glass)
[2] Authorised presentations of this medicine which are considered equal for price comparison: (1) vials (glass), (2) ampoules (glass)
[3] Authorised presentations of this medicine which are considered equal for price comparison: (1) pre-filled syringe with safety device (2) pre-filled syringe

Source: Arbeitsgemeinschaft der Österreichischen Krankenhausapotheker, Presentation: Gesundheit Österreich GmbH

2.4 Price types

The medicine price comparison will be done for officially published prices at the ex-factory price level, i.e. list prices including statutory manufacturer discounts, in line with Austrian legislation. For medicines in the out-patient sector, further price components (wholesale and pharmacy retail price levels) will be considered.

Background

There are different types to express medicine prices, depending on the sectors and perspectives.

As a result of the different add-ons in the supply chain, different price components (tariffs, duties, wholesale and retail prices, taxes) impact the final price of a medicine. In the most European countries, the relevant price types are:

» ex-factory price (manufacturer price), reflecting the manufacturer's perspective,
» pharmacy purchasing price (wholesale price), which includes the wholesale remuneration (e.g. mark-up) in addition to the ex-factory price,
» pharmacy retail price (net or gross), which includes a price-related pharmacy remuneration (e.g. mark-up) in addition to the wholesale price [15].

In 19[7] countries of this price survey, medicine prices are set at the level of the manufacturer, and the other price types are usually set through regulation for distribution remuneration. In Cyprus, Denmark, Finland, the Netherlands, Sweden and UK, medicine prices are regulated at the level of the pharmacy purchasing price, and there is neither regulation on ex-factory prices nor on wholesale margins/mark-ups; the latter are the outcome of the commercial negotiations between manufacturer and wholesaler [61-63]. Scientific research aimed to survey the average wholesale margin for these countries [64-66]. Most up-dated information is available in the '*Regelung für die Vorgehensweise der Preiskommission für die Ermittlung des EU-Durchschnittspreises gemäß § 351c Abs. 6 ASVG*' ('Regulation on Procedural Rules for the Calculation of the EU average price') [28].

Distribution add-ons are relevant in the out-patient sector. For the supply of hospitals, no mark-ups are applicable, or only wholesale mark-ups to a limited extent [67].

With regard to taxes, the relevant medicine price impacting tax is the value-added tax (VAT) in European countries that is added to the pharmacy retail price net [68]. In Portugal, in addition, the so-called 'Infarmed tax' of 0.4 percentage is a component of the final price [69]. Compared to

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In Malta exists a public and a private sector. Depending on the sector pharmaceutical prices are determined differently. While in the public sector medicines are procured through tendering, prices of medicines dispensed in the private sector are regulated at the ex-factory price level.

other countries in the world (e.g. many low- and middle-income countries without any price regulation), the add-on through taxes on the medicine price is rather low in European countries [70]. Wholesale and retail mark-ups can also considerably impact the medicine price [71].

It is strongly recommended to consider the different price components since they can be relevant for the final price [7]. It has been argued, for instance, that the pharmacy retail price gross (often also referred to a 'consumer price' or 'public price') is the appropriate price type for price comparison since this reflect the final price that patients pay [8].

However, in the European countries, with advanced universal health coverage systems and broad public funding, the price types as described above do neither reflect the coverage of the public payers nor the payments of the patients. The price type that informs about the amount paid by the public payer is the 'reimbursement price'. In some countries and for some medicines, the 'reimbursement price' is, at least partially, publicly available. For generics (and similar equivalent medicines) that are clustered in a reference price system, the 'reference price' (not to be confused with a benchmark reference price for external price referencing) is published. This 'reference price' is part of the pharmacy retail price that the public payer funds. A reference price system is a system that determines a common fixed reimbursement threshold or reference price for a group of interchangeable medicines. If the pharmacy retail price exceeds the reference price, the patient has to pay the difference, in addition to other applicable co-payments [72]. Such a reference price system is not in place in Austria. In several European countries, many medicines in the out-patient sector are not fully reimbursed, but only to a specific percentage, whereas the remainder of the price is paid by the patient [72]. In these countries, the publicly funded share of the medicine price gives an indication what the reimbursement price could be (it might be lower, due to unknown discounts, see below). In Austria, the concept of the 'Kassenpreis' (or 'Kassenverkaufspreis (KVP)' respectively) is in place. The KVP is the price which is charged by pharmacies to sickness funds if medicines are dispensed to patients on their behalf [73].

For several of the medicines included, special arrangements have been concluded between the manufacturer and the public payer, in order to manage the market entry and public funding of such medicines with possibly high budget impact. These arrangements might be simple discounts or more elaborated and complex performance-based agreements. In Europe, they are usually covered under the umbrella term of 'managed-entry agreements' (MEAs) [74, 75]. They can be distinguished into performance-based ('pay-for-performance') or financial-based agreements (e.g. in the form of discounts or price volume-agreements). The nature of MEAs can be very different between and within countries, but their use seems to be increasing. A survey of four countries (Belgium, England, the Netherlands and Sweden) identified 133 active MEAs across those countries in December 2012 [76] of which 27 were concluded on orphan medicinal products between 2006 and 2012 [77]. In Australia, 71 MEAs involving price or volume rebate agreements were in place in February 2013 [78]. While they differ in design, they tend to have in common that they are confidential [79-81].

There is published information about the extent of the discounts granted by pharmaceutical companies to public payers only in those countries in which these discounts have been regulated in law or in framework agreements. In Germany, pharmaceutical manufacturers are required to grant

a seven percent discount on reimbursable products which are not included in the reference-price system ('nicht-festbetragsgeregelte Arzneispezialitäten') [82]. However, in addition, there might be confidential arrangements between manufacturers and health insurers. In Spain, a discount of 7.5 percent on the retail price of reimbursable medicines (4 % for orphan medicines) is mandatory. It also applies to other price types of the pharmaceutical distribution chain down to the maximum ex-factory price [83]. In Greece, all reimbursable pharmaceuticals dispensed in public pharmacies are subject to a statutory discount of 9 percent [84]. In Ireland, manufacturer or importer of each quantity and value of medicines dispensed at the expense of public payers are required to grant a discount equal to 4%. In contrast to Germany, Greece and Spain, this is not based on legislation but on contractual framework agreement between the Irish pharmaceutical healthcare association and the Department of Health and the Health Service Executive (HSE) [85]. However, even in these countries the statutorily discounted prices are, in many cases, not the actual reimbursement prices, since additionally further confidential discounts are provided for some high-cost medicines [81, 86, 87].

Decision on methodological approach for this study

The comparison of prices for selected pharmaceutical specialities will be based on officially published prices by the respective national pricing and reimbursement authorities. The main price type considered will be the ex-factory price. For countries in which no statutory regulation is in place for this price type, it will be calculated according to the procedures of the Pricing Committee.

Since 2017, the Pricing Committee also considers statutory discounts of three countries (Germany, Greece and Spain) when setting the pharmaceutical prices. This price study will thus consider manufacturer prices reduced by statutory discounts in these countries. Other discounts, rebates or price agreements – even if they were publicly available – will not be considered. In addition to the new procedures of the Pricing Committee, we a sensitivity analysis will be conducted by using prices without any statutory discounts.

In order to compare pharmaceutical specialities from the in-patient and out-patient sector in one country, ex-factory prices are usually the most relevant price type and they also constitute the most adequate basis for international comparisons. In addition, a comparison of other price types for pharmaceutical specialities in the out-patient sector can provide valuable insights on the pharmaceutical distribution chain. Therefore the study will also compare pharmacy purchasing prices and pharmacy retail prices for out-patient medicines.

An essential consideration when comparing prices for pharmaceuticals is to ensure that the 'full' price is used. The 'full' price is the total amount paid to the provider of the good or service. Pharmaceuticals often involve two different sources of financing, private and public. In some cases they are paid for in full by the public payers (as in Austria), whereas in other cases they can be paid for in part by patients and in part by the public. A comparison of the price portion actually paid by the public would be interesting, but these price types are difficult to assess (e.g. different of reimbursement rates between countries and even within). This study will not consider reimbursement prices like the KVP in Austria or Erstattungspreis in Germany because actual reimbursement prices are not assessable in many countries.

2.5 Data source and timing

The price data will be retrieved from the Pharmaceutical Price Information (PPI) service of the Austrian Public Health Institute. The prices will be surveyed in September 2017.

Background

Medicine price data can be obtained from different sources.

Pricing and reimbursement of pharmaceuticals is national competence of each country. EU Member States are also free to set the prices of medicines and to decide on the treatments that they wish to reimburse. In order to ensure that such decisions are made in a comprehensible and transparent manner, the European Commission established a common procedural framework laid down in the Council Directive 89/105/EEC[8], or often simply called 'Transparency Directive'. In line with this directive, competent authorities for pricing and reimbursement of medicines are required to '*at least once a year […] publish in an appropriate publication […] a list of the medicinal products the price of which has been fixed the relevant product*'. While there is wide range of reporting standards, several price studies used such publically available price information [5, 23, 88].

Another source of price data are commercial providers, among which Quintiles IMS (formerly known as IMS)[9] is the most popular one. Quintiles IMS collects price data on medicines in different ways in the individual countries, usually at different points in the distribution chain. Figures can be collected from manufacturers', importers' or wholesalers' records. It then uses country specific information (discounts, profit regulations, reimbursement prices, etc.) collected by their intelligence unit to calculate wholesale and pharmacy margins, and other price types. Some information provided by Quintiles IMS is based on samples of prescriptions from panels of pharmacists and physicians in each country [89]. In literature, data provided by Quintiles IMS is one of the most commonly used sources for price studies [12, 13, 18, 24, 35].

With the support of an EU grant, the European Integrated Price Information Database (Euripid) was established [90] in 2010. It built on a pilot project by the Hungarian National Health Insurance Fund Administration (Országos Egészségbiztosítási Pénztár, OEP)[10]. After the end of the grant

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Council Directive 89/105/EEC of 21 December 1988 relating to the transparency of measures regulating the prices of medicinal products for human use and their inclusion in the scope of national health insurance systems

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IMS is an organization that collects data on pharmaceuticals, chemicals and other healthcare matters in several countries. IMS has a near monopoly in the collection and distribution of international pharmaceutical sales figures, which are sold commercially to the pharmaceutical industry. For several years, IMS and Quintiles have been extending their position in health-care intelligence and data analyst. On May 3rd; 2016 both companies announced their intention to merge, which was completed half year later on October 3, 2016.

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In 2017 OEP changed its name to Nemzeti Egészségbiztosítási Alapkezelő (NEAK).

period in 2013, the Euripid collaboration was set up with participating countries represented in the Board of Participants. The database reports pharmaceutical prices from 27 European countries, thereof 25 EU Member States. Euripid is a database of competent authorities for pharmaceutical pricing and reimbursement that also act as data providers, and thus only authorities that provide data to Euripid can have access. The main purpose of the price is to share information on pharmaceutical prices and facilitate price comparisons for the purpose of external price referencing (EPR) [16]. However, data can also be used for internal analysis or research, if it is approved by the board of participants [91].

The Pharmaceutical Price Information (PPI) service of the Austrian Public Health institute provides fast, reliable and independent price information on pharmaceuticals. It was established to support, according to the Austrian General Social Insurance Law, the Austrian Pricing Committee, which calculates the EU average price. The Austrian Public Health Institute has been running this service for many years, and the provided price information is commonly used in scientific articles [43, 92, 93]. As it has been mentioned above, national competent authorities for pricing and reimbursement of pharmaceuticals apply different reporting standards and – among other aspects – there is variation in the frequency of reporting. Some countries update their price list every fortnight, while others publish a complete price list once a year supplemented by a more frequent publication of price bulletins for subgroups like newly launched medicines. Once the price has been determined in a country, in the majority of countries theses prices are revised. Again, the intervals for price revisions differ, ranging from between six months and five years [16].

Decision on methodological approach for this study

Price data as of September 2017 will be surveyed. The timing and duration of the survey period may have an influence on the availability, but one month preferably in the beginning of a half-year or quarter of a year seems an appropriate timing and duration to survey data for a comparison of pharmaceutical prices. The timing of the survey will ensure the most recent pharmaceutical price in European countries, as price information is usually updated by authorities around this time. If the survey period lasts longer than one month again questions about the choice of exchange may arise (cf. section 2.8).

Price data for selected pharmaceutical specialties will be obtained from the Pharma Price Information (PPI) service of the Austrian Public Health Institute (GÖG). The service provides independent and reliable price data for all price types (ex-factory price, pharmacy purchasing price, and net and gross pharmacy retail price) based on collection from official national databases. PPI service provided data for several studies in the field of price comparisons [39, 43, 92].

2.6 Definition of reference pharmaceutical speciality

The comparison of pharmaceutical specialities will be on a like-by-like basis, i.e. same pharmaceutical form, same strength, same content and same pack. In case of non-availability of the defined pharmaceutical speciality, the closest pack size and/or a comparable packaging will be taken.

Background

Pharmaceutical specialities of an active ingredient can differ with respect to strength, pharmaceutical form, pack size and content. Those differences have an influence on pharmacokinetics and pharmacodynamics of a medicine, and may reflect differences in national treatment culture or the regulatory environment. In line with the choice of the price comparison method (single price vs. average price comparison), different approaches can be taken. The method of selecting a typical/representative pharmaceutical speciality is a common approach for price comparisons [5, 8] that are done based on the method of single price comparison. However, different pharmaceutical forms and/or strengths of the same active ingredient can have different prices. Some price studies determine a price for standard unit (e.g. per tablet, capsule, vial, 5 ml, per millilitre, per gram or per defined daily dosage (DDD) [88]. This approach serves two purposes: (1) It is a method to scale prices of different pharmaceutical specialities to a common denominator and is related to the question about the unit of analysis (see section 2.7). (2) With prices of pharmaceutical specialities being scaled to a common denominator, prices of different pharmaceutical specialities belonging to the same active ingredient can be aggregated. This is a highly sensitive area as it may address the issue of therapeutic comparability.[11] With regard to DDD the WHO Collaborating Centre for Drug Statistics Methodology clearly states that DDD are a tool for drug utilisation research and that the use of DDD for pricing decisions is '*a misuse of the system*' [94]. However, in a survey conducted among European pricing and reimbursement authorities in 2015 some respondents stated that prices per DDD are considered during pricing and reimbursement decisions [16].

Prices of medicines differ with respect to pack sizes. The WHO/HAI manual for price survey recommends to preferably use same pack sizes, and if they are not available, to use the closest pack size. However, this method needs to be applied with cautiousness, as differences may reflect different national utilisation patterns and/or could be related to national guidelines on standard course of treatment. [7]. Policy makers that use price comparisons for the purpose of EPR seem to be aware of this, and divergence of pack size is allowed to vary either within percentage bands or absolute terms [16].

WHO/HAI surveys usually collect information for two products: the originator and the lowest-priced generic equivalent. A regular comparison of prices for generic medicines in countries with

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For instance, tablets and capsules are designed so that the active ingredient is released immediately after the medicines is taken, others can have modified release characteristics. While some solid oral pharmaceutical forms (e.g. plain tablets, film-coated tablets or plain capsules) are equivalent, modified release formulations should be considered separately [7].

similar income levels is important, as they can serve as indictors of how pricing and reimbursement policies are performing [25]. Studies on generic medicines found large price variations which is related to differences in methods and sample sizes [18]. In contrast to on-patent medicines, the main driver of pharmaceutical expenditures for generic medicine is – in most of the cases – not the price component but rather the volume component and the structure component. Since both are subject to different underlying principles than the price component, it is important to clearly define the research question of price study and carefully if – and to what extent – generic medicines are included in the price study.

Decision on methodological approach for this study

The lists of pharmaceutical specialities provided by the MASSI and AAHP were translated to the classification used by EMA when authorising different presentations: strength, content (concentration), pharmaceutical form, packaging and pack size. Using this classification system the price study applies a rather conservative approach and considers only products of same strength, same pharmaceutical form, same content, same package and same pack size as eligible for the cross-country comparisons. Exceptions – however only to a minor extent – are allowed with regard to packaging and pack size. If a pharmaceutical speciality is not available in the same pack size, then a speciality with the closest pack size is used for the comparison. If a speciality is not available in the same packaging, then the pharmaceutical speciality with comparable packaging will be considered (e.g. blister-wallet is considered as comparable to blister in a carton and vis-versa). Pharmaceutical specialities selected for this study (cf. Table 2.2 and Table 2.3) for which these exemption might likely be valid were marked with a footnote. With regard to pack size, a threshold for differences is set at 30 percent compared to the reference pharmaceutical speciality.

If price information of the originator is not available, but price information for a generic medicine of the same pharmaceutical speciality is available, then price information of the generic medicine will not be considered. The previous GÖG price study pointed to limitations in availability of price data for originator medicines after patent expiry in several countries. This is related to the national policies of reimbursing solely the lowest-priced generic alternative, and prices of higher-priced medicines (frequently among those, the originator medicine) will no longer be included in national price lists as their reimbursement had been discontinued [2]. As it can be assumed that prices for generics are below prices of originators, the inclusion of generics would obviously distort the analysis.[12]

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A price comparison of generic medicines could be of high interest for policy makers, and they are encouraged to conduct such analyses on a regular basis. However, the research question of such a price comparisons will be different and – as consequence – the methods design will differ as well.

2.7 Unit of analysis

The prices will be compared on a unit basis (i.e. per tablet, per vial).

Background

Literature reports different approaches of how to compare medicine price (and expenditure) data:

» **Comparison at the level of the pharmaceutical speciality:** This approach requires pharmaceutical products to have the same pharmaceutical form, content, packaging and size in order to be eligible for the price comparison. A major limitation of this approach is that it may give a biased picture about medicine availability. If a particular pharmaceutical speciality is not available, alternative pharmaceutical forms or therapeutic alternatives may are available.

» **Scaling prices of pharmaceutical specialities to a common denominator:** As in section 2.6, some price studies aggregate different strengths, pharmaceutical forms and pack sizes by either calculating a price for standard unit (e.g. per tablet, capsule, vial, 5 ml), per millilitre, per gram or per defined daily dosage (DDD) [88]. Although WHO advises against the use of DDD in comparing medicines for the purposes of pricing, reimbursement and cost-containment decisions [94], it has been argued that the use of DDD could be a helpful tool for the calculation and interpretation of comparative studies [95]. In contrast to a comparison on the level of a package, DDDs have the advantage that they are able to account for differences in therapy tradition in other countries as they enable a normalisation of prices [96].

» **Comparison of costs per treatment cycle:** When competent authorities decide on pricing and reimbursement of pharmaceuticals, they increasingly rely on health technology assessments. In doing these assessment, pharmaceutical therapies for a defined indication are compared with respect to their therapeutic efficacy, but also related to the cost per (annual) treatment cycles. Although being a helpful indicator in reimbursement decisions, this approach may not qualify for price comparisons, as it rather focuses on potential pharmaceutical expenditures.

Decision on methodological approach for this study

Prices will be scaled to common denominator, and the comparison will be done on a unit basis (i.e. per tablet, per vial). As explained in section 2.6, comparable specialities will be selected on a rather conservative approach only allowing differences in packing or package size. As different pack sizes are, in principle, not comparable, there is a need to adjust for different units. Scaling prices to DDD could, despite given limitations, also be a feasible approach for the price study but with regard to decisions on methods taken so far, it would not have an impact on the results of the study but only on their presentation[13].

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As the price study applies a rather conservative approach when comparing medicines, the question of scaling prices in units or DDD would correspond to the questions of using metric or imperial systems.

2.8 Exchange rate

Prices in national currencies other than the Euro will be converted into Euro by using the monthly average exchange rate reported by the European Central Bank.

Background

A prerequisite for (medicine) price comparison is the conversion of price data into the same currency.[14] Most prices studies use official exchange rates as published by central banks [4, 6]. Exchange rates are determined by the demand and supply for different currencies which are influenced by currency speculation, interest rates, government interventions and capital flows between countries. They can be volatile, and observed price differences might capture factors that go beyond usual price differences. This volatility does also have an effect on pharmaceutical prices, particularly countries that apply EPR to determine or revise pharmaceutical prices. Research has shown that exchange rates have a statistically significant effect on pharmaceutical prices, particularly in countries with pharmaceutical price regulation [97, 98].

It has been argued that the choice of appropriate exchange rates is essential in ensuring realistic prices rather than prices arising from (excessive) exchange rate volatility. Price studies account for this volatility by using average exchange rates over longer periods ranging from 1 to 12 months. The choice which average to use has again major implications for price studies. It has to be balanced between equalising short-term fluctuations and avoiding too long periods [36]. Monthly or quarterly exchange rates appear to be appropriate, but yearly exchange rates are also feasible.

When exchange rates are used to convert to a common currency, the results reflect not only differences in the characteristics of goods and services, but also differences in price levels across countries [51]. Purchasing power parities (PPPs), however, are conversion rates that show the ratio of the prices in national currencies of the same basket of goods and services in different countries. When PPPs are used to convert prices to a common (currency) denominator, prices reflect only differences in the characteristics of goods and services consumed in countries. In the EU Eurostat is responsible for calculating purchasing power parities for consumer goods, including pharmaceuticals. Together with OECD, Eurostat developed a method to calculate PPPs for household purchases of medical goods and services [51], and it was also used in a study to calculate the price level of pharmaceuticals for the European Union and other European countries expressed in PPPs [14]. Furthermore, per capita GDP expressed in PPPs can be used to convert prices to a common denominator for international price comparisons [5].

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It is a similar issues as presented in Section 2.7 because again a denominator is needed but this time in terms of monetary units.

Decision on methodological approach for this study

The price study will convert prices into Euro by using the monthly average exchange of the month prior to the survey period (i.e. average exchange rate of August 2017). Using purchasing power parities instead of exchange rates is a feasible alternative to address the problems associated with exchange rates. The method of calculating PPPs for pharmaceuticals as it has been applied in only one study [14] does not seem to be the most appropriate method. Instead of PPPs for pharmaceuticals it would be also possible to use per capita GDP expressed in GDP to convert prices of pharmaceuticals to common denominator [88]. Research has shown a correlation between PPPs for health services and per capita GDP [99]. Therefore GDP per capita expressed in PPP could be used as a – good but not perfect – approximation. As GDP per capita expressed in PPP are also related to the weighting of prices (cf. section 2.9) the price study will explore in a sensitivity analysis how results will change when using PPPs for conversion.

2.9 Weighting of prices

In an alternative scenario, prices will be adjusted for the income level of countries.

Background

It has been argued that international price comparisons do not sufficiently consider ability-to-pay, especially when price comparisons are used as a tool for determining prices of medicines (external price referencing) [100]. It has been suggested that price comparisons should be modified by taking into account the income level of the compared countries. Thus, an adjustment parameter related that reflects the ability to pay (e.g. GDP per capita) should be applied [16].

Furthermore, it has been argued that not all medicines included in a study have the same relevance. This is of particular interest if different medicines are aggregated and average prices are calculated. In order to account for national utilisation patterns and local epidemiologic patterns, weights can be applied to the prices of pharmaceutical specialities. The size of these weights can be determined by sales, market shares or number of prescriptions. Depending on the research question and on the country that is taken as denominator, different indices (e.g. Laspeyres index, Paasche index, Fischer index) can be constructed [12, 19].

Decision on methodological approach for this study

While price data will first be analysed unweighted, a sensitivity analysis will be conducted to explore the effects of an adjustment for different income levels in the countries included in the price comparison.

Any further weighting (volume, sales, etc.) of the price is not scope of this single price comparison.

3 Outlook

This study protocol will be published on the website of the Austrian Public Health Institute (www.goeg.at) and will be open to a public consultation. We welcome comments of stakeholders and experts through the feedback form provided by GÖG. Comments can be sent by **Tuesday, 5 September 2017**. GÖG highly appreciates receiving comments and will carefully assess them with a view of implementing suggestions in the price survey.

4 References

[1] Rechtsinformationssystem (RIS). Bundesgesetz über die Gesundheit Österreich GmbH (GÖG), Fassung vom 10.07.2017. 2017.

[2] Vogler S, Schneider P, Zimmermann N. Preisvergleich kostenintensiver Arzneimittel 2015 (Wissenschaftlicher Endbericht). Wien: Gesundheit Österreich GmbH, 2016.

[3] Vogler S, Zimmermann N, Habl C. Preisanalyse von 30 kostenintensiven Arzneispezialitäten in Österreich im Vergleich mit anderen europäischen Ländern; Wien: ÖBIG, im Auftrag des Bundesministeriums für Gesundheit; 2014.

[4] Andersson F. Methodological aspects of international drug price comparisons. Pharmacoeconomics. 1993;4(4): 247-56.

[5] Busse R, Panteli D, Schaufler J, Schröder H. Europäischer Preisvergleich für patentgeschützte Arzneimittel. Arzneiverordnungs-Report 2016: Springer; 2016. p. 193-206.

[6] Machado M, O'Brodovich R, Krahn M, Einarson TR. International drug price comparisons: quality assessment. Revista Panamericana de Salud Pública. 2011;29(1): 46-51.

[7] WHO, Health Action International (HAI). Measuring medicine prices, availability, affordability and price components. 2nd edition.; Geneva, ; 2008.

[8] Danzon PM, Kim JD. International price comparisons for pharmaceuticals. Pharmacoeconomics. 1998;14(1): 115-28.

[9] Wagner JL, McCarthy E. International differences in drug prices. Annu Rev Public Health. 2004;25: 475-95.

[10] Babar ZU, Lessing C, Mace C, Bissell K. The availability, pricing and affordability of three essential asthma medicines in 52 low- and middle-income countries. Pharmacoeconomics. 2013;31(11): 1063-82.

[11] Leopold C, Mantel-Teeuwisse AK, Seyfang L, Vogler S, de Joncheere K, Laing RO, et al. Impact of External Price Referencing on Medicine Prices-A Price Comparison Among 14 European Countries. Southern Med Review. 2012;5(1).

[12] Aho E, Johansson P, Rönnholm G. International price comparison of pharmaceuticals 2016 - - a volume based analysis of Swedish pharmaceutical prices relative to 19 other European countries. Agency DaPB. Stockholm, 2017.

[13] Brekke KR, Holmås TH, Straume OR. Are Pharmaceuticals Still Inexpensive in Norway? A Comparison of Prescription Drug Prices in Ten European Countries. SNF Report No. 08/10. 2010.

[14] Konijn P. Pharmaceutical products-comparative price levels in 33 European countries in 2005. Statistics in focus: Economy and finance. 2007;45: 1977-0316.

[15] WHO Collaborating Centre for Pharmaceutical Pricing and Reimbursement Policies. Glossary of pharmaceutical terms. Update 2016. Vienna: Gesundheit Österreich GmbH (GÖG), in coordination with the Pharmaceutical Pricing and Reimbursement Information (PPRI) network and the World Health Organization (WHO), 2016.

[16] Vogler S, Lepuschütz L, Schneider P, Stühlinger V. Study on enhanced cross-country coordination in the area of pharmaceutical product pricing. European Commission, Directorate-General for Health and Food Safety Ed.; Brussels: Publications Office of the European Union 2016.

[17] Schwabe U, Paffrath D. Arzneiverordnungs-Report 2016: Springer; 2016.

[18] Wouters OJ, Kanavos PG. A comparison of generic drug prices in seven European countries: a methodological analysis. BMC Health Services Research. 2017;17(1): 242.

[19] Morgan SG, Leopold C, Wagner AK. Drivers of expenditure on primary care prescription drugs in 10 high-income countries with universal health coverage. Canadian Medical Association Journal. 2017;189(23): E794-E9.

[20] Patented Medicine Price Review Board. The drivers of prescription drug expenditures - a mtehodological report. Ottawa: Patented Medicine Prices Reveiw Board, 2013.

[21] Martikainen JE, Häkkinen U, Enlund H. Adoption of new antiglaucoma drugs in Finland: Impact of changes in copayment. Clin Ther. 2007;29: 2468-76.

[22] Martikainen JE, Saastamoinen LK, Korhonen MJ, Enlund H, Helin-Salmivaara A. Impact of restricted reimbursement on the use of statins in Finland. A register-based study. . Medical Care. 2010;48: 761-6.

[23] Kanavos PG, Vandoros S. Determinants of branded prescription medicine prices in OECD countries. Health Economics Policy and Law. 2011;6(3): 337.

[24] Danzon PM, Furukawa MF. International prices and availability of pharmaceuticals in 2005. Health Affairs. 2008;27(1): 221-33.

[25] Cameron A, Ewen M, Ross-Degnan D, Ball D, Laing R. Medicine prices, availability, and affordability in 36 developing and middle-income countries: a secondary analysis. Lancet. 2009;373(9659): 240-9. Epub 2008/12/02.

[26] Cameron A, Hill S, Whyte P, Ramsey S, Hedman L. WHO guideline on country pharmaceutical pricing policies. (WHO) WHO. Geneva: World Health Organization (WHO), 2015.

[27] Frost DW, Cook DJ, Heyland DK, Fowler RA. Patient and healthcare professional factors influencing end-of-life decision-making during critical illness: a systematic review. Critical care medicine. 2011;39(5): 1174-89.

[28] Bundesministerium für Gesundheit und Frauen (BMGF). Regelung für die Vorgehensweise der Preiskommission für die Ermittlung des EU-Durchschnittspreises gemäß § 351c Abs. 6 ASVG. 2017.

[29] European Commission. Council Directive 89/105/EEC of 21 December 1988 relating to the transparency of measures regulating the prices of medicinal products for human use and their inclusion in the scope of national health insurance systems. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31989L0105:en:HTML.

[30] World Bank. World Bank Country and Lending Groups. 2017.

[31] Eurostat. Eurostat Health Database http://ec.europa.eu/eurostat/web/health/health-care/data/database. 2017.

[32] Martikainen J, Kivi I, Linnosmaa I. European prices of newly launched reimbursable pharmaceuticals – a pilot study. . Health Policy 2005;. 2005;74: : 235–46. .

[33] Schwabe U. Arzneiverordnungen 2006 im Überblick. Arzneiverordnungs-Report 2007: Springer; 2008. p. 3–35.

[34] Kanavos P, Ferrario A, Vandoros S, Anderson GF. Higher US branded drug prices and spending compared to other countries may stem partly from quick uptake of new drugs. Health Affairs. 2013;32(4): 753–61.

[35] Danzon PM, Furukawa MF. Prices and availability of pharmaceuticals: evidence from nine countries. Health Affairs. 2003: W3–521.

[36] Kanavos P, Nicod E. What is wrong with orphan drug policies? Suggestions for ways forward. Value in Health. 2012;15(8): 1182–4.

[37] World Health Organization Regional Office for Europe. Access to new medicines in Europe: technical review of policy initiatives and opportunities for collaboration and research. Copenhagen, 2015.

[38] Gonçalves A, Maraninchi D, Vernant J-P. Challenging the soaring price of cancer medicines: a call for equity and transparency. Annals of Oncology. 2016;27(9): 1812–3.

[39] Iyengar S, Tay-Teo K, Vogler S, Beyer P, Wiktor S, de Joncheere K, et al. Prices, Costs, and Affordability of New Medicines for Hepatitis C in 30 Countries: An Economic Analysis. PLoS Med. 2016;13(5): e1002032.

[40] Vogler S, Schneider P, Zimmermann N. European price comparison of high cost hospital medicines. European Journal of Hospital Pharmacy. 2016;23(Suppl 1): A163–A4.

[41] Vogler S, Zimmermann N, Babar Z-U-D. Price comparison of high-cost originator medicines in European countries. Expert Review of Pharmacoeconomics & Outcomes Research. 2017;17(2): 221–30.

[42] van Mourik MS, Cameron A, Ewen M, Laing RO. Availability, price and affordability of cardiovascular medicines: a comparison across 36 countries using WHO/HAI data. BMC Cardiovasc Disord. 2010;10: 25. Epub 2010/06/11.

[43] Vogler S, Vitry A, Babar Z-U-D. Cancer drugs in 16 European countries, Australia, and New Zealand: a cross-country price comparison study. The Lancet Oncology. 2016;17(1): 39-47.

[44] Hoen Et. Access to cancer treatment: A study of medicine pricing issues with recommendations for improving access to cancer medication. OXFAM, 2014.

[45] Simoens S. International comparison of generic medicine prices. Current Medical Research and Opinion. 2007;23(11): 2647-54.

[46] Olivier J. Wouters PGK, Martin McKee. Comparing generic drug markets in Europe and the U.S.: prices, volumes, and spending. The Milbank Quarterly. 2017.

[47] Gooi M, Bell CM. Differences in generic drug prices between the US and Canada. Applied Health Economics & Health Policy. 2008;6(1): 19-26. Epub 2008/09/09.

[48] Vogler S. How large are the differences between originator and generic prices? Analysis of five molecules in 16 European countries. Farmeconomia Health economics and therapeutic pathways. 2012;13 (Suppl 3): 29-41.

[49] Stargardt T, Schreyogg J, Busse R. Pricing behaviour of pharmacies after market deregulation for OTC drugs: the case of Germany. Health Policy. 2007;84(1): 30-8. Epub 2007/06/08.

[50] Vogler S, Arts D, Sandberger K. Impact of pharmacy deregulation and regulation in European countries. Vienna: Gesundheit Österreich Forschungs- und Planungs GmbH, 2012.

[51] Statistical Office of the European Communities. Eurostat-OECD methodological manual on purchasing power parities: OECD Publishing; 2006.

[52] Health Action International (HAI). Collecting Evidence on Medicine Prices & Availability. Geneva2016, accessed 17 August.

[53] Statistik Austria. Gesundheitsausgaben in Österreich laut System of Health Accounts (SHA). http://statistik.at/web_de/statistiken/menschen_und_gesellschaft/gesundheit/gesundheitsausgaben/index.html2017, accessed 23.05.2017.

[54] Zimmermann N, Habimana K. Arzneimittelausgaben in Österreich. 2017.

[55] Hogerzeil HV. Essential medicines and human rights: what can they learn from each other? Bulletin of the World Health Organization. 2006;84(5): 371-5. Epub 2006/05/20.

[56] Hogerzeil HV, Samson M, Casanovas JV, Rahmani-Ocora L. Is access to essential medicines as part of the fulfilment of the right to health enforceable through the courts? Lancet. 2006;368(9532): 305-11. Epub 2006/07/25.

[57] Perehudoff SK, Laing RO, Hogerzeil HV. Access to essential medicines in national constitutions. Bulletin of the World Health Organization. 2010;88(11): 800-.

[58] World Health Organization. Equitable access to essential medicines: a framework for collective action. Geneva, 2004.

[59] Homedes N, Ugalde A. Multisource drug policies in Latin America: survey of 10 countries. Bulletin of the World Health Organization. 2005;83(1): 64-70.

[60] Nikfar S, Kebriaeezadeh A, Majdzadeh R, Abdollahi M. Monitoring of National Drug Policy (NDP) and its standardized indicators; conformity to decisions of the national drug selecting committee in Iran. BMC international health and human rights. 2005;5(1): 5.

[61] Vogler S, Habimana K. Pharmaceutical pricing policies in European Countries. Commissioned by Change to Win. Vienna, 2014.

[62] Vogler S, Habl C, Bogut M, Voncina L. Comparing pharmaceutical pricing and reimbursement policies in Croatia to the European Union Member States. Croatian Medical Journal. 2011;52(2): 183-97.

[63] Vogler S. The impact of pharmaceutical pricing and reimbursement policies on generics uptake: implementation of policy options on generics in 29 European countries—an overview. Generics and Biosimilars Initiative (GaBI) Journal. 2012;1(2): 93-100.

[64] Kanavos P, Schurer W, Vogler S. Pharmaceutical Distribution Chain in the European Union: Structure and Impact on Pharmaceutical Prices. London/Vienna: EMINet / LSE / GÖG, 2011.

[65] Vogler S, Schneider P. Vergütung der Arzneimitteldistribution in den europäischen Ländern. Gesetzliche Regelungen und Durchschnittsspannen. Wien: Gesundheit Österreich Forschungs- und Planungs-GmbH, 2015.

[66] Vogler S, Habl C, Habimana K, Schmickl B. Distributionsspannen von Arzneimitteln in sieben europäischen Ländern. 2014.

[67] Vogler S, Habl C, Leopold C, Mazag J, Morak S, Zimmermann N. PHIS Hospital Pharma Report. Vienna: Pharmaceutical Health Information System (PHIS), 2010.

[68] Vogler S, Zimmermann N, Habl C. Understanding the components of pharmaceutical expenditure—overview of pharmaceutical policies influencing expenditure across European countries. Generics and Biosimilars Initiative Journal (GaBI Journal). 2013;2(4): 178-87.

[69] Infarmed, editor. Major reforms, current and planned measures, and the current pharmaceutical pricing and reimbursement system in Portugal. PPRI networ meeting; 2009; Berlin: PPRI Secretary.

[70] Creese A. Sales Taxes on Medicines. Working Paper 5, WHO/HAI Project on Medicine Prices and Availablility, 2014.

[71] Ball D. Regulation of mark-ups in the pharmaceutical supply chain – WHO/HAI review series on pharmaceutical pricing policies and interventions. Working paper 3: . Geneva: World Health Organization and Health Action International, 2014.

[72] Dylst P, Vulto A, Simoens S. Reference pricing systems in Europe: characteristics and consequences. Generics Biosimilars Initiative J. 2012;1: 127-31.

[73] Zimmermann N, Vogler S. PPRI/PHIS Pharma Profile Austria. Vienna: Pharmaceutical Pricing and Reimbursement Information (PPRI) / Pharmaceutical Health Information System (PHIS), 2012.

[74] Ferrario A, Kanavos P. Managed entry agreements for pharmaceuticals: The European experience: LSE; 2013.

[75] Pauwels K, Huys I, Vogler S, Casteels M, Simoens S. Managed Entry Agreements for oncology drugs: lessons from the European experience to inform the future. Frontiers in pharmacology. 2017;8.

[76] Ferrario A, Kanavos P. Dealing with uncertainty and high prices of new medicines: a comparative analysis of the use of managed entry agreements in Belgium, England, the Netherlands and Sweden. Social Science & Medicine. 2015;124: 39-47.

[77] Morel T, Arickx F, Befrits G, Siviero P, van der Meijden C, Xoxi E, et al. Reconciling uncertainty of costs and outcomes with the need for access to orphan medicinal products: a comparative study of managed entry agreements across seven European countries. Orphanet Journal Of Rare Diseases. 2013;8(1): 198.

[78] Vitry A, Roughead E. Managed entry agreements for pharmaceuticals in Australia. Health Policy. 2014;117(3): 345-52.

[79] Pauwels K, Huys I, Vogler S, Casteels M, Simoens S. Managed Entry Agreements for Oncology Drugs: Lessons from the European Experience to Inform the Future. Frontiers in pharmacology. 2017;8: 171.

[80] Morgan SG, Vogler S, Wagner AK. Payers' experiences with confidential pharmaceutical price discounts: A survey of public and statutory health systems in North America, Europe, and Australasia. Health Policy. 2017;121(4): 354-62.

[81] Vogler S, Zimmermann N, Habl C, Piessnegger J, Bucsics A. Discounts and rebates granted to public payers for medicines in European countries. Southern Med Review. 2012;5(1): 38-46.

[82] SGB V. Sozialgesetzbuch (SGB) Fünftes Buch (V)-Gesetzliche Krankenversicherung. Fünftes Buch Sozialgesetzbuch-Gesetzliche Krankenversicherung. 2014;3.

[83] Real Decreto-ley 8/2010, de 20 de mayo, por el que se adoptan medidas extraordinarias para la reducción del déficit público., (2010).

[84] Hellenic Parliament. ΚΕΦΑΛΑΙΟ Α΄ ΡΥΘΜΙΣΗ ΘΕΜΑΤΩΝ ΕΘΝΙΚΟΥ ΣΥΣΤΗΜΑΤΟΣ ΥΓΕΙΑΣ ΚΑΙ ΕΠΟΠΤΕΥΟΜΕΝΩΝ ΦΟΡΕΩΝ. 2010.

[85] Health Service Executive. Framework agreement between the Irish pharmaceutical Healtcare Association Ltd and the Departemtn of Health and the Health Service Executive on the supply terms, conditions and prices of medicines. 2012.

[86] Morgan S, Daw J, Thomson P. International best practices for negotiating 'reimbursement contracts' with price rebates from pharmaceutical companies. Health Affairs. 2013;32(4): 771-7.

[87] Vogler S, Zimmermann N, Habl C, Mazag J. The role of discounts and loss leaders in medicine procurement in Austrian hospitals - a primary survey of official and actual medicine prices. Cost Effectiveness and Resource Allocation. 2013;11(1): 15.

[88] Busse R, Panteli D, Schaufler J, Schröder H, Telschow C, Weiss J. Preise patentgeschützter Arzneimittel im europäischen Vergleich. Die deutschen Arzneimittelpreise im Vergleich zu den Listenpreisen in fünf ausgewählten europäischen Ländern Wissenschaftliches Institut der AOK (WIdO) und TU Berlin Unter http://www wido de/arz_arzneimittelmark/EU-Preisvergleich_2016 html Berlin. 2016.

[89] Dukes MNG. Drugs and money: Prices, affordability and cost containment: IOS press; 2003.

[90] European Commission Enterprise and Industry Directorate-General. Development of a database on pricing of medicinal products in the EU. Call for proposal. ACTION ENT/IMA/1.1.10.3.8. Brussels 2009.

[91] Habl C, Leopold C. What Happens To Originator Medicines When (Generic) Followers Enter The Public Market. Value in Health. 2016;19(7): A443-A4.

[92] Leopold C, Mantel-Teeuwisse AK, Vogler S, de Joncheere K, Laing RO, Leufkens HGM. Is Europe still heading to a common price level for on-patent medicines? An exploratory study among 15 Western European countries. Health Policy. 2013;112: 209-16.

[93] Vogler S, Kilpatrick K, Babar Z-U-D. Analysis of Medicine Prices in New Zealand and 16 European Countries. Value in Health. 2015;18(4): 484-92.

[94] WHO Collaborating Centre for Drug Statistics Methodology. Purpose of the ATC/DDD system. 2009

[95] Pfannkuche M, Glaeske G, Neye H, Schöffski O, Hoffmann F. Kostenvergleiche für Arzneimittel auf der Basis von DDD im Rahmen der Vertragsärztlichen Versorgung. Gesundheitsökonomie & Qualitätsmanagement. 2009;14(01): 17-23.

[96] Schneider M. Die deutschen Arzneimittelpreise im europäischen Vergleich: Gutachten für den Verband Forschender Arzneimittelhersteller (VFA) und die Bundesvereinigung Deutscher Apothekerverbände (ABDA): BASYS Beratungsgesellschft für angewandte Systemforschung mbH; 1999.

[97] Danzon PM, Chao LW. Cross-national price differences for pharmaceuticals: how large, and why? Journal of Health Economics. 2000;19(2): 159-95. Epub 2000/08/18.

[98] Kanavos P, Costa-Font J, Seeley E. Competition in off-patent drug markets: Issues, regulation and evidence. Economic Policy. 2008;23(55): 500-44.

[99] Lorenzoni L, Koechlin F. International Comparisons of Health prices and Volumes: New Findings. OECD. Paris, 2017.

[100] Cassel D, Ulrich V. Herstellerabgabepreise auf europäischen Arzneimittelmärkten als Erstattungsrahmen in der GKV-Arzneimittelversorgung. Zur Problematik des Konzepts internationaler Vergleichspreise (Gutachten für den Verband Forschender Arzneimittelhersteller eV) Duisburg-Essen/Bayreuth. 2012.

[101] Busse R, Panteli D. Arzneimittelpreise im europäischen Vergleich: methodische Überlegungen und aktuelle Ergebnisse. In: (MIG) FMiG, editor. Berlin: TU Berlin; 2016.

5 Annex

Table 5.1:
Annex – Matrix of methods for price comparison

Scope of countries	2	3	4	…	EU15	…	EU28(EU27)		All OECD countries	Others

Scope of products	1 products	Several products								
		Within a certain indication group (e.g. Oncology, chronic heart insufficiency)			With marketing authorisation in certain period (e.g. 2016)			'all' = Top selling products or generics, etc.		
Index construction	No	No (only listing)	Yes		No (only listing)	Yes		No (only listing)	Yes	
Application of weights			No (only Average)	Volume		No (only average)	Volume		No (only average)	Volume

Unit of analysis	Same package ("like-by-like")	Standard unit	Gramm (of active ingredient)	DDD

Price type	Ex-factory price		Wholesale price / Pharmacy Purchasing price		Net Pharmacy Retail price (excl. VAT)		Gross Pharmacy Retail price (incl. VAT)	
	List price i.e. without discounts & rebates	Real prices (i.e. price including discounts & rebates	List price i.e. without discounts & rebates	Real prices (i.e. price including discounts & rebates	List price i.e. without discounts & rebates	Real prices (i.e. price including discounts & rebates	List price i.e. without discounts & rebates	Real prices (i.e. price including discounts & rebates

Price adjustments	No (daily exchange rate at date of survey)	No (exchange rate over a period)	Purchasing Power Parities (PPP)	GDP (per capita)

Source: Busse R and Panteli D [101]; Presentation: Gesundheit Österreich GmbH (GÖG)

Table 5.2:
Annex – List of medicines surveyed in the German publication 'Arzneiverordnungs-Report 2016', ranked by expenditures for social health insurance

Active Ingredient	ATC	MAH	Brand name	Expenditures in Mio. €
Adalimumab	L04AB04	Abbott	Humira®	858,7
Sofosbuvir/Ledipasvir		Gilead Science	Harvoni®	725,3
Rivaroxaban	B01AF01	Bayer	Xarelto®	577,7
Etanercept	L04AB01	Pfizer	Enbrel®	494,0
Dimethylfumarat	N07XX09	Biogen	Tecfidera®	290,7
Ranibizumab	S01LA04	Novartis	Lucentis®	277,0
Enoxaparin	B01AB05	Sanofi-Aventis	Clexane,Lovenox®	266,5
Insulin glargine	A19AE04	Sanofi-Aventis	Lantus®	254,1
Imatinib	L01XE01	Novartis	Glivec®	253,0
Sofosbuvir	J05AX15	Gilead	Sovaldi®	252,3
Glatirameracetat	L03AX13	Teva	Copaxone®	249,8
Tiotropoiumbromid	R03BB04	Boehringer	Spiriva®	248,9
Abirateron	L02BX	Jannsen-Cilag	Zytiga®	233,6
Pantoprazol	A02BC02	Takeda	Pantoloc®	230,0
Interferon beta 1a	L03AB07	MSD	Rebif®	228,4
Infliximab	L04AB02	MSD	Remicade®	228,1
Metamizol-Natrium	N02BB02	Zentiva	Novaminsulfon Lichtenstein®	226,1
Formoterol & Budensonid	R03AK07	AstraZeneca	Symbicort®	221,9
Lenalidomid	L04AX04	Celgene	Revlimid®	221,6
Interferon beta 1b	L03AB07	Biogen	Avonxex®	213,6
Ibuprofen	M01AE01	BGP	Brufen®	208,4
Fingolimod	L04AA	Novartis	Gilenya®	205,5
Aflibercept	S01LA	Bayer	Eylea®	202,7
Apixaban	B01AF02	BSM	Eliquis®	188,5
Tenofovirdisoproxil und Emtricitabin	J05AR03	Gilead	Truvada®	181,4
Pregabalin	N03AX16	Pfizer	Lyrica®	170,3
Insulin aspart	A10AB05	Novo-Nordis	Novorapid®	168,6
Oxycodon und Naloxon	N02AA55	Mundipharma	Targinb®	166,7
Golimumab	L04AB06	Janssen-Cilag	Simponi®	165,1
Enzalutimid	L02BB04	Astellas	Xtandi®	156,7

Source: Schwabe U and Paffrath D [17], Presentation: Gesundheit Österreich GmbH (GÖG)

Table 5.3:
Annex - List of medicines from the previous GÖG price study 2015

Active Ingredient	Strength		Unit	Form	ATC	MAH	Brand name
Abirateron	250	mg	120	Tablet	L02BX03	Janssen	Zytiga®
Adalimumab	40	mg	2	Pre-filled syringe	L04AB04	Abbott	Humira®
Agalsidase alfa	1	mg/ml	1	Concentration for …	A16AB03	Shire	Replagal®
Alteplase	50	mg	1	Powder and solvent for solution for injection or infusion	B01AD02	Boehringer	Actilyse®
Anidulafungin	100	mg	1	Powder for solution for infusion	J02AX06	Pfizer	Ecalta®
Aripiprazol	10	mg	28	Tablet	N05AX12	BMS/Otsuka	Abilify®
Azacitidin	25	mg/ml	1	100 mg Powder for solution for injection	L01BC07	Baxter, Celgene	Vidaza®
Bendamustine	2,5	mg/ml	5	100 mg Powder for solution for infusion	L01AA09	Temmler / Mu-nidpharma	Levact®
Bevacizumab	25	mg/ml	1	16 ml Concentrate for solution for infusion	L01XC07	Roche	Avastin®
Bisoprolol	5	mg	50	Film-coated tablet	C07AB07	Merck	Concor®
Bortezomib	3,5	Mg	1	Powder for solution for injection	L01XX32	Janssen	Velcade®
Cetuximab	5	Mg/ml	1	20 ml solution for infusion	L01XC06	Merck	Erbitux®
Dabigatran etexilat	110	mg	60	Hard capsule	B01AE07	Boehringer	Pradaxa®
Daclatasvir	60	mg	28	Film-coated tablet	J05AX14	BMS	Daklinza®
Denosumab	120	mg	1	Solution for injection	M05BX04	Amgen	Xgeva®
Duloxetin	60	mg	28	Hard capsule	N06AX21	Lilly	Cymbalta®
Emtricitabin / Tenofovir disoproxil / Efavirenz	200/245/ 600	mg	30	Film-coated tablet	J05AR06	Gilead	Atripla®
Emtricitabin / Tenofovir disoproxil / Rilpivirin	200/245/ 25	mg	30	Film-coated tablet	J05AR08	Gilead	Eviplera®
Enoxaparin	100	mg	10	Pre-filled syringe	B01AB05	Sanofi	Lovenox®
Escitalopram	10	mg	28	Film-coated tablet	N06AB10	Lundbeck	Cipralex®
Etanercept	50	mg	4	Pre-filled syringe	L04AB01	Wyeth	Enbrel®
Everolimus	10	mg	30	tablet	L01XE10	Novartis	Afinitor®
Fingolimod	0,5	mg	28	Hard capsule	L04AA27	Novartis	Gilenya®
Formoterol / Beclometa-son	100/6	µg/µg	120 Hübe	PIS (pressurised inhalation solution)	R03AK08	Chiesi	Foster®

Active Ingredient	Strength		Unit	Form	ATC	MAH	Brand name
Formoterol / Budesonid	160/4,5	µg/µg	120	Powder for inhalation	R03AK07	AstraZeneca	Symbicort® Turbo-haler
Glatirameracetat	20	mg/ml	28	Solution for injection	L03AX13	Teva	Copaxone®
Golimumab	50	mg	1	Pre-filled syringe	L04AB06	Janssen	Simponi®
Imatinib	400	mg	30	Film-coated tablet	L01XE01	Novartis	Glivec®
Infliximab	100	mg	3	Powder for infusion	L04AB02	Janssen	Remicade®
Insulin aspart	100	E/ml	5	Injection suspension	A10AD05	NovoNordisk	Novomix® 30 Pen-fill
Interferon-beta-1a	30/0,5	mcg/ml	4	Pre-filled Pen	L03AB07	Biogen	Avonex®
Ipilimumab	5	Mg/ml	1	40 ml concentrate solution for infusion	L01XC11	BMS	Yervoy®
Lenalidomid	10	mg	21	Hard capsule	L04AX04	Celgene	Revlimid®
Linagliptin	5	mg	30	Film-coated tablet	A10BH05	Boehringer	Trajenta®
Metformin / Sitagliptin	50/1000	mg	56	Film-coated tablet	A10BD07	MSD	Janumet®
Paclitaxel	5	mg/ml	1	100 mg powder for solution for infusion	L01CD01	Celgene	Abraxane®
Panitumumab	20	mg/ml	1	5 ml concentrate for solution for infusion	L01XC08	Amgen	Vectibix®
Pantoprazol	40	mg	28	Gastroresistant tablet	A02BC02	Nycomed / Takeda	Pantoloc®
Pegfilgrastim	6	mg	1	Pre-filled syringe	L03AA13	Amgen	Neulasta®
Pemetrexed	500	mg	1	Powder for solution for infusion	L01BA04	Lilly	Alimata®
Pomalidomid	4	mg	21	Hard capsule	L04AX06	Celgene	Imnovid®
Raltegravir	400	mg	60	Film-coated tablet	J05AX08	MSD	Isentress®
Rilmenidin	1	mg	30	tablet	C02AC06	Servier	Iterium®
Rituximab	500	Mg	1	50 ml concentrate for solution for infusion	L01XC02	Roche	Mabthera®
Rivaroxaban	20	mg	28	Film-coated tablet	B01AF01	Bayer	Xarelto®
Rosuvastatin	10	mg	30	Film-coated tablet	C10AA07	AstraZeneca	Crestor®
Salmeterol und Fluticason	50/500	µg/µg	60	Powder for inhalation	R03AK06	GSK	Seretide® Diskus forte
Simeprevir	150	mg	28	Hard capsule	J05AE14	Janssen	Olysio®
Sitagliptin	100	mg	28	Film-coated tablet	A10BH01	MSD	Januvia®
Sofosbuvir	400	mg	28	Film-coated tablet	J05AX15	Gilead	Sovaldi®
Sugammadex	100	Mg/ml	10	2 ml solution for injection	V03AB35	Merck	Bridion®
Sunitinib	50	mg	30	Hard capsule	L01XE04	Pfizer	Sutent®
Teicoplanin	400	Mg	1	Powder and solvent for solution for infusion	J01XA02	Sanofi	Targocid®
Tenofovir disoproxil / Emtricitabin	200/245	mg	30	Film-coated tablet	J05AR03	Gilead	Truvada®

Active Ingredient	Strength		Unit	Form	ATC	MAH	Brand name
Tiotropiumbromid	18	mcg	30	capsule	R03BB04	Boehringer	Spiriva®
Tocilizumab	20	mg/ml	1	Concentration for …	L04AC07	Roche	RoActemra®
Trastuzumab	150	Mg	1	Powder for solution for infusion	L01XC03	Roche	Herceptin®
Trazodon	150	mg	60	Retard tablet	N06AX05	CSC/Angeli	Trittico® retard
Treprostinil	10	mg/ml	1	Solution for infusion	B01AC21	MC Gregor Cory	Remodulin®
Ustekinumab	45	mg	1	Pre-filled syringe	L04AC05	Janssen	Stelara®

Source: Gesundheit Österreich GmbH