HAZARDOUS DRUG CONSUMPTION IN ADVANCED AGE:

THE CRUX OF POLYPHARMACY

A Side Event to the Annual Session of the United Nations Commission on Narcotic Drugs (CND) in March 2025

Organised by the NGO Committee on Ageing, United Nations Vienna

IMPRESSUM

Publication on the side event in the framework of the 68th annual session of the Commission on Narcotic Drugs (CND) of the United Nations, Vienna, 10-14 March 2025, organised by the NGO Committee on Ageing, UN Vienna

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was constituted in 1981 as a Substantive Committee, being part of the Conference of NGOs in Consultative Relationship with the United Nations (CoNGO). The members of the Committee are international Non-Governmental Organisations (iNGOs) interested in multifaceted issues related to ageing and older persons. The Committee collaborates with similar NGO committees at the UN in New York and Geneva.

Topics discussed by the Committee in monthly meetings at the UN in the 'Decade of Healthy Ageing' (2020-2030) include Human Rights issues, intergenerational perspectives, the impact of digitalization, lifelong learning, as well as cultural aspects of ageing. In order to bring these topics into the open, the NGO Committee on Ageing holds regular side events at the annual sessions of the UN "Commission on Narcotic Drugs (CND)" and the UN "Commission on Crime Prevention and Criminal Justice (CCPCJ)". A special topical conference is organised to celebrate the UN's "International Day of Older Persons (IDOP)" on October 1st every year.

If you are interested in further information concerning the Committee, please consult our website: www.ngoageingvie.org

2. The Programme of the Side Event

United Nations Commission on Narcotic Drugs (CND)
Side Event organised by the NGO Committee on Ageing, UN Vienna
at the premises of the United Nations in Vienna
on Thursday, 13 March 2025

HAZARDOUS DRUG CONSUMPTION IN ADVANCED AGE: THE CRUX OF POLYPHARMACY

OPENING REMARKS
Dirk Jarré, Chair of the NGO Committee on Ageing, UN Vienna, President of the European Federation of Older Persons (EURAG)

SPEAKERS
Thomas Frühwald: Professor, member of the Austrian Bioethics Committee, Board member of the Austrian Society for Geriatrics and Gerontology and the NGO Committee on Ageing, UN Vienna

Martin Wehling: Professor em. of Clinical Pharmacology at the University of Heidelberg. He has designed the first positive-negative drug labelling approach Fit-for-The-Aged (FORTA) in 2008

Shelley Ann Sternberg: Director of the Shaare Zedek Memory Clinic of Hebrew University, and Regional Director of Geriatric Services and Clinical Investigator at the Maccabi Healthcare Services

Katharina Kieslich: Health Expert in Pharmaceutical Economics and Policy at the Austrian National Public Health Institute

CLOSING with recommendations by Thomas Frühwald

3. Reflections on the topic of the Side Event

Polypharmacy is often described as the routine use of five or more medications per day. Multiple medication use (polypharmacy) is common among the older population as ageing carries the inherent risk of multimorbidity, that is the presence of two or more long-term health problems. This includes over-the-counter, prescription and/or traditional or complementary medicine used by patients. Although polypharmacy addresses illnesses and can improve and prolong quality of life, the use of multiple medication contains major risk factors, such as unwanted drug events like drug-drug and drug-disease interactions. That may eventually lead to premature death. Patients over 65, particularly those living in care homes, are most vulnerable. Therefore, reviewing patients' medication lists should be mandatory to reduce hospital and emergency department visits. Raising awareness of the problematic and providing sound information to the medical professions and also to patients is of paramount importance. As an example: In Germany, around 42% of people over the age of 65 take five or more prescription drugs a day, according to the Federal Association of German Pharmacists in 2024. Globally, preventable medication-related harm is 5% (1 in 20 patients), the WHO says. It is estimated that a total of 18 billion US dollars in expenditures could be avoided by managing polypharmacy properly.

The use of evidence-based approaches in reviewing multiple medication use or polypharmacy is benefitting patients, carers and family members and is eventually an important factor in avoiding unnecessary expenses and thus a key contribution for safeguarding health systems.

4. Introduction by Dirk Jarré, Chair of the NGO Committee on Ageing, UN Vienna


Dr. Dirk Jarré

On March 13, 2025, the NGO Committee on Ageing, UN Vienna, held a side event in the framework of the annual session of the Commission of Narcotic Drugs (CND) at the United Nations in Vienna. This event was entitled:

"Hazardous Drug Consumption in Advanced Age: The Crux of Polypharmacy"

The side event on the topic of "Polypharmacy" was very well attended. The NGO Committee on Ageing at the UN in Vienna was very proud to have international scientists and experts on board who provided deep insights and new data on the medical, social and economic effects of **polypharmacy**. Polypharmacy is described as the routine use of more than five medications per day. This is common among older persons, as ageing carries an increased risk of multimorbidity.

Thomas Frühwald, one of Austria's leading gerontologists, addressed the geriatric perspective of the topic. Those involved in the side event, including Frühwald, agreed that treating older patients carries the potential risks of *overtreatment*, *undertreatment* and *mistreatment*, which all can have serious consequences for persons with multiple diseases. Being overtreaded can lead to falls and multiple contusions; being undertreated can mean a lack of therapeutic interventions, e. g., in the case of pain; being mistreated is when clinical decisions are guided by disease specific outcomes, not by individual patient's needs. Patients over 65, particularly those living in care homes, are most vulnerable. Therefore, Thomas Frühwald recommended two essential approaches: first, the inclusion of older individuals in randomized clinical trials (RCTs) based on strong ethical principles, and second, the application of individually tailored care for all patients.

Martin Wehling, a highly renowned international pharmacologist, has developed a positive-negative drug list to identify both over- and undertreatment. Be treated adequately, he said, improves the functional status of a person and the quality of life. With his FORTA (Fit-fOR-The-Aged)-list, a drug classification system designed as a clinical tool, with which physicians can identify potentially inappropriate medications (PIM) and potentially omitted medications (POM). The FORTA-list has been clinically validated by Martin Wehling and the result show that pure 'deprescribing' is no longer sufficient to improve the prognosis for older patients. Medications often need to be newly prescribed which is now called **'represcribing'** that means leaving out potentially inappropriate medication and prescribing potentially omitted medications based on FORTA categories.

Shelley A. Sternberg, a geriatrician and epidemiologist, is author of numerous publications on health issues affecting older persons, argued that polypharmacy is more prevalent among those living in poverty than among those who are better off financially. Her argument is convincing, as poorer older persons tend to visit the doctor more frequently in the hope of receiving additional medication. This is a significant challenge for Israel's healthcare system, given the fact that the older population in Israel is growing fast. She explained that better management of patients' medication could prevent half of all unplanned hospital admissions due to negative drug reactions – which means millions of admissions. Israel's efforts to combat polypharmacy are yielding initial successes with a consumption of more than five medications per day among the age group over sixty-five declining. Additionally, clinical pharmacists in Israel play a key role in reducing the amount of medication taken by older persons.
Katharina Kieslich, a researcher in the field of pharmacoeconomics, stated that polypharmacy in the elderly populations can lead to higher rates of patients requiring outpatient care, as well as higher rates of hospitalizations due to adverse drug events (ADEs). Katharina Kieslich stated that there is a strong interrelation between healthcare utilisation, polypharmacy and hospitalization which increase the costs for the health system. As a scientist, she is calling for targeted intervention and a better management to address polypharmacy in older persons. She recommended, e. g., the implementation of medication reviews in primary care, and systematic medication recommendations by pharmacologists in hospital settings. All the speakers argued for a change in the way medications are prescribed, a process that could be understood as Wehling's 'represcribing'. Although the costs-effectiveness of intervention might be unclear initially, ultimately it benefits both: the health systems, by reducing medication costs, and patients by improving their health and well-beings.

Dirk Jarré
Bad Ischl, September 2025

5. Polypharmacy – A Geriatric Medicine View

THOMAS FRÜHWALD Prof. Dr., Austria

Gerontologist and Geriatrician, Member of the Austrian Bioethics Committee, Board member of the Austrian Society for Geriatrics and Gerontology and the NGO Committee on Ageing, UN Vienna

Multiple medication use (polypharmacy), described as the routine application of more than five medications per day, is common among the older population for aging carries the risk of multimorbidity. Unwanted drug events may eventually lead to premature deaths. Patients over 65, particularly those living in care homes, are most vulnerable.

The short presentation will address these issues and indicate possibilities of competently dealing with these problems.

I will present some basic principles of the complex issue of ***multi-medication / polypharmacy*** in the ***group of older patients*** before addressing the specific geriatric perspective of this topic in order to help in dealing with it.

Some 20 years ago Mary Tinetti, professor of social and policy studies at Yale University and Linda Fried, professor of geriatrics and epidemiology at Columbia University stated that *"A primary focus on disease, given the changed health needs of patients, inadvertently leads to undertreatment, overtreatment, or mistreatment (…)"* They postulate the end of the disease era. (Tinetti & Fried, 2004).

As one cause of **undertreatment** they define not treating symptomatic patients who do not fulfill the current diagnostic criteria of a disease. One form of undertreatment is the lack of therapeutic interventions taking into consideration socio-economic, psychological and environmental causal factors, emphasizing only biological determinants of disease instead.

Overtreatment is simultaneous treatment of all diagnosed diseases, this also leads to polypharmacy with serious negative consequences, like for example in the case of a 90 years old patient with dementia, multimorbidity and orthostatic hypotension with falls and multiple contusions due to aggressive antihypertensive therapy resulting in postural hypotension. Or the case of a patient 85 years old, with bronchial carcinoma, strict glycemic control with insulin and oral antidiabetics resulting in recurrent hypoglycemia with its negative consequences on cerebral function.

Mistreatment results when clinical decisions are guided by disease specific outcomes, not by the individual patient‘s preferences.

The proposed strategies for dealing with the limitations of the disease-oriented care are:

- The multidisciplinary geriatric teams, its interventions based on a standardized geriatric assessment
- The concept of the geriatric syndromes
- Integration of palliative care in geriatrics
- Clinical decision making guided by individual patient goals

Tinetti and Fried demand that *"The time has come to abandon disease as the focus of medical care"* and that *"The concept of individual disease should not be abandoned, but should rather be better integrated into individually tailored care (…)"* (Tinetti & Fried, 2004)

Professor Antonio Cherubini, geriatrician at the university of Perugia sees an ethical dimension in this topic:

Patients taking part in randomized clinical trials (RCT's) for new therapies are different from those that we encounter in every day practice.
They are younger, predominantly male (thus contradicting demography), they consume less drugs than the average "real life" patient (…).
The restrictive inclusion criteria of the RCT's compromise their validity creating homogeneous groups of patients allowing smaller, shorter, cheaper clinical trials.

"The validity of clinical guidelines supposedly based on the best available evidence is questionable, since the evidence is not the best (…)"
"Clearly, an ***ethical issue*** *underlies the exclusion of older individuals because this is, at least in part, the consequence of* ***ageism****."* (Cherubini, 2011)

Glenys Godlovitch of the University of Calgary also sees the ethical dimension of applying uncertain therapeutic intervention in geriatric patients. She describes how most of the phase I to III clinical trials exclude patients older than 70.

They either are being excluded from the potential user population, or they are consuming drugs without evidence of their efficacy particularly in their cohort. Either way, this constitutes a considerable social injustice: as end-users they are "guinea pigs" even though they have explicitly been excluded from the phase IV clinical trials necessary for their licensing, this constitutes thus an uncontrolled trial setting.

In conclusion, it has to be stated that withholding potentially efficient, useful drugs because of their advanced age is disrespectful, immoral, discriminating, unethical. Administering

drugs whose background information is deliberately incomplete is equally immoral, lacking respect, discriminating, unethical (…). (Godlovitch 2003) Exposing older patients to a “de facto” phase IV trial, even positively intended, constitutes a form of abuse of older persons.

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Polypharmacy
A Geriatric Perspective

Thomas Frühwald

NGO on Ageing
United Nations Vienna

Polypharmacy
- a topic for geriatric medicine

- Advances in pharmacology sometimes are a double-edged sword:
  - Frequently there is improvement in the health status
  - But also frequently risks for some patient groups, f.e. the geriatric patients
- Polypharmacy:
  - There is not an exact quantitative definition...
  - Consumption of unnecessary drugs
  - It is not so much about the number of drugs, but more about the quality of prescribing
- Polypharmacy is unnecessary drug therapy, therapy that is of more harm than benefit ... *(Wooten JM. South Med J. 2015:108(2): 97-104)*

Polypharmacy
- a topic for geriatric medicine

- Polypharmacy – causal factors:
  - Multimorbidity (geriatric patients)
  - Various physicians
  - Various pharmacies
  - Many OTC drugs
  - Alternative therapies, plant based, „natural“ therapies and supplements

- Polypharmacy
  - Confuses patients and their carers
  - Worsens adherence for imprtant drugs
  - Worsens outcomes
  - Increases health care costs Polypharmacy
    - a topic for geriatric medicine

Under-,over- or mistreatment
***Tinetti** ME, **Fried** T: **The End of the Disease Era**. Am J Med. 2004, 116 (3): 179-85*

*“A **primary focus on disease**, given the changed health needs of patients, inadvertently leads to **undertreatment, overtreatment,** or **mistreatment**…”*

Undertreatment:

- **One cause:** not treating symptomatic patients who do not fulfill the current diagnostic criteria of a disease
- **One form:** lack of therapeutic interventions considering socio-economic, psychological and environmental causal factors, emphasizing only biological determinants of disease

Under-,over- or mistreatment

***Tinetti** ME, **Fried** T: **The End of the Disease Era**. Am J Med. 2004, 116 (3): 179-85*

Overtreatment:

- Simultaneous treatment of all diagnosed diseases leads to overtreatment, also to polypharmacy with serious negative consequences
- Example:
  - 90 years old patient with dementia, multimorbidity: orthostatic hypotension with aggresive antihypertensive therapy ➔ fall
  - 85 years old patient with bronchial carcinoma, strict glyecmic control with insulin and oral antidiabetcs ➔ recurrent hypoglycemia

Mistreatment:

- Results when clinical decisions are guided by disease specific outcomes, not by the individual patient‘s preferences...

The End of the Disease Era

***Tinetti** ME, **Fried** T. **The End of the Disease Era** .Am J Med. 2004, 116 (3): 179-85*

Strategies for dealing with the limitations of the disease oriented care:

- Multidisciplinary geriatric teams, geriatric assessment
- The concept of the geriatric syndromes
- Integration of palliative care in geriatrics
- Clinical decision making guided by individual patient goals

“The time has come to abandon disease as the focus of medical care“

“The concept of individual disease should not be abandoned, but should be better integrated into individually tailored care…”

Discrimination of the old – ageism – in clinical research

***Cherubini** A et al. Arch Intern Med 171(6), 550-56, 2011*

- Patients taking part in RCT‘s look different from those we see in daily practice…
- They are younger, mostly male (thus contradicting demography, consume few drugs... Corresponding to only a smaller number of “real life“ patients are
- The restrictive inclusion criteria for RCT’s compromise their validity: homogeneous patient are being created, allowing shorter, cheaper trials…

“The validity of clinical guidelines supposedly based on the best available evidence is questionable, since the evidence is not the best…”

*“Clearly, an **ethical issue** underlies the exclusion of older individuals because this is, at least in part, the consequence of **ageism**.”*

6. Report on Martin Wehling's contribution: Polypharmacy Looked at by a Clinical Pharmacologist

by Annemarie Spiessberger, Mag.[a], Member of the NGO Committee on Ageing, UN Vienna

(Text authorised by Martin Wehling, MD, Professor em. of Clinical Pharmacology at the University of Heidelberg, Germany)

The main part of the content of the following contribution is taken from the research paper: *"Medication optimization according to the Fit fOR The Aged (FORTA) rules improves functional status in patients hospitalized for geriatric rehabilitation"*
Authors: Farhad Pazan, Martin Wehling, Christel Weiss, Helmut Frohnhofen

Link:
Medication optimization according to the Fit fOR The Aged (FORTA) rules improves functional status in patients hospitalized for geriatric rehabilitation | European Geriatric Medicine

One of the most remarkable collective achievements of society is that longevity has risen substantially over time. According to the forecast of the *World Health Organization*, the number of persons aged 60 and older will increase worldwide from 1.1 billion in 2023 to 1.4 billion in 2030. (WHO 2025)

However, living longer is associated with risks of various diseases. This is particularly true for older persons and for persons in geriatric care. Functional status is an indicator of independence and quality of life, whereas functional limitations are detrimental to the status of older persons, e. g. by threatening a person's independence and quality of life. To assess the abilities for basic activities in daily living (ADL), such as walking, bathing/showering, dressing, eating, grooming, using a toilet, *"Barthel's Index (BI)"* is widely used to measure a person's functional status by medical professionals. The higher the score - which ranges from 0 to 100 – the lesser the impairments. Risk factors of functional impairments in older adults can be many and include - among others - poor self-rated health, burden of diseases, lifestyle habits and medication. These factors can be modified in geriatric rehabilitation through multi-component interventions and can improve the functional status of an older person. (Pazan & Wehling et al. 2023, p. 478)

Polypharmacy or multiple medications is one of the risk factors of older persons. Polypharmacy is defined as the prescription of five or more drugs per day. The prevalence of polypharmacy among older adults in Europe was almost identical for women and men: 32,1% for women and 32,2% for men whereas in the USA 44% of elderly men and 57% of elderly

women take five or more drugs every day. (Pazan & Wehling et al. 2023, p. 478)

In Germany, around “42% of people over the age of 65” take five or more prescription drugs a day. Out of these patients approximately “20-25% receive potentially inappropriate drugs” and around “86% of the daily doses of drugs taken by persons over age 65 are prescribed by general practitioners”. (Moshammer & Haumann et al. 2016)

Since polypharmacy addresses illnesses and can improve and prolong quality of life, various studies show that the number of drug prescriptions increases with age as does the number of diseases. However, “due to the lack of evidence regarding safety and efficiency of many drugs in older adults, polypharmacy is often inappropriate and leads to adverse clinical outcomes such as functional impairment, [e. g. falls] and can lead to a loss of independence in self-care activities or deterioration in self-care skills”. (Pazan & Wehling et al. 2023, p. 478)[1] These unfavorable outcomes may eventually lead to premature death. Patients over 65, particularly those living in care homes, are most vulnerable to adverse drug events (see Thomas Frühwald in his abstract on polypharmacy – A Geriatric Medicine View in this publication).

To improve pharmacotherapy in older people, many drug listing approaches have been developed, e.g. the Beers or START/STOPP Criteria[2] which support physicians and medical care providers in identifying potentially inappropriate medications (PIMs) and (START) potentially omitted medications (POMs). (O’Mahony et al. 2023) START/STOPP is a list of both drug and action recommendations.

The FORTA (Fit-For-The-Aged)-list is the only pure drug appropriateness list for older persons that not only identifies *potentially inappropriate medicines (PIM)*, but also medications that should be given, i.e. *potentially omitted medicines (POM)*. It is therefore the only positive-negative medication list for older persons that has been clinically validated. The VALFORTA trial is a prospective randomized[3] interventional study that investigated the impact of a FORTA (Fit-For-The-Aged)-guided prescription versus standard prescription care in older in-hospital patients. (Pazan & Wehling 2023, p. 478)

Furthermore, the FORTA-guided prescription is a drug classification system designed as a clinical tool to help monitoring and optimizing the drug therapy and care management of

1 At this point Fahard Pazan and Martin Wehling (2023) postulate that several studies which showed an association between drug prescriptions and functional decline are observational or cross-sectional so that a causal relationship between drug prescription and functional status is inconclusive.

2 START criteria means: “Screening Tool to Alert doctors to Right Treatment“ and STOPP criteria means: „Screening Tool of Older Person’s Prescriptions“. (Denis O’Mahony et al. 31 May 2023) URL: https://rdcu.be/eo3vi, accessed on 02 June 2025.

3 In a randomised study, subjects are randomly assigned to either the intervention group or the control group. The aim of randomisation is to eliminate bias (cf. Turner 2013. In: Encyclopedia of Behavioral Medicine, pp 1618-1619, online)

older patients. A total of 299 items, consisting of the most frequently used substances and substance classes for long-term drug therapy in older patients (with exceptions to this rule), have been assigned positive and negative labels ranging from A-B-C-D according to the state of evidence as to risk/benefits and age-appropriateness, aligned to 30 diagnoses and indication areas.

FORTA (Fit-For-The-Aged) Categories:

Class A (A-bsolutely)	This medication/drug has proved to be particularly beneficial; there are clear-cut benefits in terms of efficacy/safety ratio in elderly patients for a given indication.
Class B (B-eneficial)	This medication/drug has proven obvious efficacy in the elderly, but does also have limitations in the extent of effect or additional safety concerns.
Class C (C-areful)	This medication/drug has questionable efficacy/safety profiles in the elderly, should be avoided or omitted in the presence of too many drugs; lack of benefits or emerging side effects; review/find alternatives.
Class D D-on't)	This medication/drug should be avoided in the elderly; omit first and review/find alternatives.

Source: Medizinische Fakultät Mannheim der Universität Heidelberg. URL: https://www.umm.uni-heidelberg.de/ecas/experimentelle-pharmakologie/research/group-wehling/, accessed on 03 June 2025. Martin Wehling (2015, p. 58): How to Use the FORTA ("Fit fOR The Aged") List to Improve Pharmacotherapy in the Elderly.

The main results and details of the first VALFORTA clinical trial are available on:
Medication optimization according to the Fit fOR The Aged (FORTA) rules improves functional status in patients hospitalized for geriatric rehabilitation |European Geriatric Medicine

More about the first study that analysed the impact of a prospective guided randomised intervention to optimise quality of drug prescription, under- and overtreatment on functional outcomes in older in-hospital rehabilitation patients – the VALFORTA clinical trial – follows below:

"In short, the inclusion criteria were age 65 years or over and three or more long-term medication or age 60 years or over and 6 or more medications and a hospitalization for five days or longer. Multi-morbidity is defined as three or more medical conditions at the same time. Patients were randomized to standard geriatric care (control group) or additional management of medication according to the FORTA criteria (intervention group). The primary end point of the VALFORTA trial was the FORTA score. The FORTA score is the sum of over- and undertreatment prescription errors according to the FORTA list or a composite measure of over-, under- and mistreatment. Consecutive patients were randomized to the intervention

and control ward and the outcome assessment was blinded." (Pazan & Wehling 2023, p. 478)
The collected personal data included: "age, gender, body-mass-index (BMI), number of diseases, number of medications on admission and discharge, number of applied occupational and physiotherapeutic units, and length of stay. The evaluation of the medication was conducted on admission and on discharge of hospital according to the FORTA criteria in both groups. Additionally, all subjects received a comprehensive geriatric assessment as a clinical routine on admission and the assessment of activities of daily living (ADLs) by means of Barthel's Index (BI)" usual walking speed, and mobility by means of the Tinetti-test on discharge (Pazan & Wehling 2023, p. 479). The aim is to assess a patient's walking pattern and thus their risk of falling.

A brief summary of the main results: Ninety-six patients belonged to the intervention group (FORTA criteria) and ninety-three patients belonged to the control group (placebo group). The patients were characterized by gender, diseases, co-morbidities, the type of the referral to the geriatric unit, level of care, and the number of patients in nursing home residence. As expected and typical for patients of a geriatric rehabilitation unit, the majority of the individuals had mobility disabilities, recent falls, and related fractures.

Interestingly, the portion of patients in the intervention group which were referred from other hospitals was higher than in the control group. In contrast the portion of community-dwelling patients in the control group was higher. At the time of admission, most patients were moderately impaired in the activities of daily living. Only a minority of patients suffered from dementia and dementia severity was usually mild. The number of drugs on admission was substantial. Furthermore, despite management in a geriatric unit, the number of drugs on discharge did not decrease as PIMs (potentially inappropriate medications) were replaced by POMs (potentially omitted medications) at comparable numbers. Yet, management according to the FORTA list led to an improvement in overall quality of medication as measured by FORTA-score in both groups. Of interest is that the amount of improvement in medication quality was significantly greater in the intervention group

An improvement of the basic activities of daily living was found in 72 patients out of 96 (75%) of the intervention group and in 54 patients out of 93 (58%) of the control group. The number of patients in the control group with no change in the improvement of the activities of daily living was significantly higher as compared to those in the intervention group. No association was found for the number of treatment units, dementia, gender, length of stay and age.

In addition, falls occurred in 19 patients out of 87 (22%) of the control group and in 11 patients out of 75 (15%) in the intervention group.

The main result of the VALFORTA trial was a significant and independent association between the gain in functional status and the FORTA-guided improvement of the drug treatment. This association was found in a secondary analysis and did not prove causality. It needs to be confirmed in further clinical trials (cf. Pazan & Wehling et al. 2023: 480-481).
Observational studies consistently show the negative association between the anticholinergic drug burden and functional status. Anticholinergic drug burden may build up in a person taking multiple medications belonging to the FORTA-list labelled 'D' as a large number of medications with a FORTA label 'D' have anticholinergic activities. The geriatric pharmacologists *Sarah Hilmer and Danijela Gnjidic* name "dry mouth, urinary retention, constipation, cognitive decline and loss of functional capacity to perform activities of daily living as common anticholinergic adverse effects. In older adults, the anticholinergic burden is linked with serious adverse effects including falls, functional decline, delirium and death." (Hilmer & Gnjidic 2022, p. 118).

"A meta-analysis that included 25 studies comprising 10.980 patients, analysed the impact of strategies to reduce polypharmacy on clinically relevant endpoints like mortality or hospital admissions. In summary, observational studies support the evidence that improving the quality of prescribing as well as reducing over and under-prescriptions, is associated with functional improvement but none of the trials dealt with the topic of this work, namely the impact of optimisation of pharmacotherapy on geriatric rehabilitation. The FORTA-guided intervention encompasses all three main interventional components: it addresses over- and under-treatment and supports the best choice of a prescription, thus avoiding mistreatment. (Pazan & Wehling 2023, p. 481)

In the VALFORTA clinical trial, the impact in both groups was an improvement of prescribing what reflects general positive effects in geriatric care. However, the impact was significantly greater in the intervention group. Importantly, the number of patients who were referred from a hospital to the geriatric ward was significantly higher in the intervention group and the patients in this group were significantly older as compared to the control group. Both attributes would be assumed to indicate worse outcomes, but the intervention was successful despite these disadvantages in the intervention group. This result underscores the need of a comprehensive management of prescriptions – as it is supported by FORTA. (Pazan & Wehling 2023, p. 481-482)

The VALFORTA trial also showed that the FORTA concept is suitable to successful communication and implementation. (Wehling & Burkhardt et al. 2016, p. 262)

4 "Of note, the number of subjects with dementia was low in the sample compared to a usual geriatric unit. Therefore, results cannot be generalised to all older subjects but only to patients with a comparable disease burden." (Pazan & Wehling et al. 2023: p. 481)

The term ‘deprescribing’ is en vogue but only adresses the process of stopping PIMs, the issue of POM is not included. In the VALFORTA-trial, the number of inappropriate and omitted medication were three per patient. This means that the status of polypharmacy (≥ 5 + 3=8) didn’t change but patients experienced clinical improvements and less side effects. For this process of both stopping and adding drugs, the term *“represcribing”* is currently favoured, as it is considered to be more appropriate for addressing medication problems in older patients. (Wehling & Petrovic 2022, p. 529)

In conclusion, it should be wholeheartedly emphasized that ageing is generally a very joyful experience, despite the fact that a person may have some physical and/or mental limitations. To improve pharmacotherapy in older persons, Martin Wehling and his team designed the first positive-negative drug labelling approach, the “Fit-for-The-Aged” (FORTA-list) system, which could help physicians to ameliorate medications for older persons. In this sense, to ameliorate medication treatment involves identifying and eliminating potentially inappropriate medications (PIMs), as well as identifying and prescribing potentially omitted medication (POM). The clinical results (VALFORTA clinical trial to prove the FORTA-list) show that pure ‘deprescribing’ is no longer sufficient to improve the prognosis for older patients, as ‘good’ drugs often need to be newly prescribed which is now called ‘**represcribing’**, that means leaving out potentially inappropriate medication and prescribing potentially omitted drugs which should be the standard for future medication optimisation approaches in older patients. (Martin Wehling, abstract in this publication).
From a pharmacologist’s perspective, ‘represcribing’ based on FORTA categories could be implemented in various public health institutions by using modern digital technology, such as an appropriate algorithm.

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7. Polypharmacy in Israel: A Geriatrician's Perspective

SHELLEY A. STERNBERG MD, MSCE, FRCPC, Israel

Director of the Shaare Zedek Memory Clinic of Hebrew University, and Regional Director of Geriatric Services and Clinical Investigator at the Maccabi Healthcare Services

Introduction

Polypharmacy—commonly defined as the concurrent use of multiple medications—is an increasingly important concern in geriatric medicine. The term is variably defined across organizations: the World Health Organization (WHO) describes it broadly as the concurrent use of multiple medications by a patient, while many studies operationalize it as the use of five or more medications, with some studies extending the threshold to eight or more. The United Kingdom's National Health Service (NHS) highlights that polypharmacy can be both appropriate and inappropriate, depending on whether the benefits outweigh the risks in individual patients.

The prevalence of polypharmacy has risen in parallel with population aging, multimorbidity, and expanded therapeutic options. In older adults, polypharmacy is a double-edged sword: while it may improve disease management, extend life expectancy, and enhance quality of life, it can also result in adverse drug events, hospitalizations, drug-drug interactions, and diminished adherence. A systematic review by Masnoon et al. estimated that polypharmacy affects between 10% and 90% of older adults depending on definitions and populations studied.[2] Older women are a specific population at increased risk for adverse outcomes of polypharmacy.

Internationally, polypharmacy has been recognized as a public health issue.[3] The WHO's Medication Safety in Polypharmacy report called for system-level interventions, emphasizing the role of clinical pharmacists, electronic medical record (EMR) decision-support tools, deprescribing strategies and patient engagement.[1] Studies have also highlighted associations between polypharmacy and reduced health-related quality of life, and increased frailty.

Israel provides a unique case study. With one of the fastest-growing older populations in the OECD and a highly digitized national health system, Israel has implemented multiple initiatives aimed at improving medication safety in older adults. This paper reviews the Israeli experience, focusing on epidemiology, health system strategies, and ongoing challenges in addressing polypharmacy.

Polypharmacy in Israel

Epidemiology and Trends Israel's population is aging rapidly: nearly 12% of the population is aged 65 and older, with projections showing a steep rise by 2035. Data from Goldsmith et al. reported that among Israelis aged 65+, the mean number of daily medications is among the highest in OECD countries, with a significant proportion of older adults taking six or more drugs daily.

Clalit Health Services, Israel's largest HMO providing care to approximately 50-55% of Israel's older population, has published data showing that polypharmacy correlates strongly with age and chronic disease burden. Among older Clalit members:

- More than 50% of those aged ≥65 take at least six medications.
- Approximately one-third take eight or more.
- A smaller but significant proportion use ten or more concurrent medications.

Similar findings were reported in Maccabi Healthcare Services, Israel's second largest HMO providing care to about 35% of Israel's older population, where EMR alerts notify clinicians when patients are prescribed more than eight chronic medications. These alerts form part of a broader strategy to encourage medication review during annual geriatric assessments.

Policy and Health System Initiatives

Israeli policymakers have addressed polypharmacy through multiple channels:

1. Government Oversight and Reports
   - State Comptroller General reports in 2011 and 2017 identified polypharmacy as a systemic problem and urged coordinated action.
   - The National Geriatric Advisory Committee published recommendations in 2017 focused on deprescribing and pharmacist involvement.

2. Ministry of Health Directives and Incentives
   - Issued in 2013, 2016, 2019, and 2022, these directives emphasized reducing inappropriate prescriptions.
   - Financial incentive programs began in 2016, initially rewarding HMOs for implementing clinical pharmacist consultations.
   - From 2022–2024, incentives expanded to reducing opioid and antibiotic prescribing and improving adherence in chronic disease management.

3. Health Maintenance Organization (HMO) Interventions

- Clalit: Uses HMO-developed digital decision-support modules embedded in EMRs to flag inappropriate prescribing, combined with pharmacist consultations and quality measures.
- Maccabi: Uses digital decision- support software. Implements “Golden Age” visits for members ≥65, incorporating structured mini geriatric assessments for family physicians and medication reviews. Data on national quality measures as well as data on populations at risk are also gathered and clinical pharmacist consultations are done physically and virtually.
- Meuhedet and Leumit: Have adopted system-wide medication review programs (AI-based in Leumit), combined with clinical pharmacists consultations.

Lessons from Special Contexts

The October 7, 2023 Hamas attacks highlighted the vulnerability of older adults dependent on multiple chronic medications. Among the 33 abducted older Israelis, several were unable to access essential medications during captivity, contributing to preventable morbidity and mortality. This tragic event underscores the centrality of medication continuity in both everyday and crisis contexts.

Alignment with International Trends

Israel’s initiatives mirror global recommendations. For example, the OECD Health Working Paper No. 147 on the economics of medication safety emphasizes that investment in pharmacist-led interventions and decision-support technology is cost-effective, reducing hospitalizations and improving outcomes.[6] Israel’s digital health infrastructure offers an advantage in implementing these measures at scale.

International Comparative Insights: The SIMPATHY Study

The SIMPATHY (Stimulating Innovation Management of Polypharmacy and Adherence in the Elderly) study, a European Union–funded project, provides an important framework for understanding how health systems can address polypharmacy through system-level change.[8] Conducted across ten European countries, the study highlighted that polypharmacy prevalence ranged widely, with more than 40% of individuals aged 65 and older taking five or more medications daily in many regions. The SIMPATHY consortium emphasized the need for integrated policies, clinical governance, and multidisciplinary collaboration, particularly through pharmacist involvement and electronic health record (EHR)–based support.

Findings from SIMPATHY are directly relevant to Israel. Like the European countries studied, Israel faces the dual challenge of high medication use and rising multimorbidity in older adults. However, Israel's advanced digital infrastructure places it in a unique position to implement lessons from SIMPATHY effectively. For example, the widespread use of EMRs in Israeli HMOs parallels the digital innovation pathways promoted by SIMPATHY, particularly in identifying inappropriate prescriptions and supporting deprescribing. Furthermore, the emphasis on pharmacist integration is echoed in Israel's Ministry of Health financial incentive programs, which prioritize pharmacist consultations and medication reviews as central strategies.

SIMPATHY also underscored the importance of patient and caregiver engagement, highlighting that polypharmacy management must not be limited to clinician decision-making. Israel's current approaches could be enhanced by greater incorporation of shared decision-making and patient education, ensuring that medication plans align with patients' values, goals of care, and functional priorities. By aligning with SIMPATHY recommendations, Israel can move toward a more holistic, patient-centered strategy for managing polypharmacy.

Conclusions

Polypharmacy is an inevitable consequence of aging and multimorbidity, but it must be carefully managed to avoid harm. In Israel, the prevalence of polypharmacy among older adults is high, with substantial proportions taking six or more medications daily. While polypharmacy may be appropriate in many cases, inappropriate prescribing remains a concern, with risks of drug-drug interactions, adverse events, and decreased adherence.

The Israeli healthcare system—through its four national HMOs, government directives, and policy incentives—has implemented a multifaceted approach. Clinical pharmacist consultations, EMR-based decision support, and quality metrics linked to financial incentives are central strategies. Evidence suggests that these interventions improve adherence, reduce inappropriate prescribing, and align with international best practices.

Nonetheless, challenges remain. Medication reviews are time-consuming, deprescribing is complex, and system-level incentives must balance quality with feasibility. The October 2023 events highlighted the additional importance of ensuring medication continuity for vulnerable populations during crises.

Israel's experience offers valuable lessons for other nations: a combination of strong digital infrastructure, policy-level support, and integration of pharmacists into care teams can significantly mitigate the risks of polypharmacy. Future directions should include a national coordinated program on polypharmacy in older adults, expansion of deprescribing research,

and greater emphasis on patient-centered outcomes such as quality of life and functional status.

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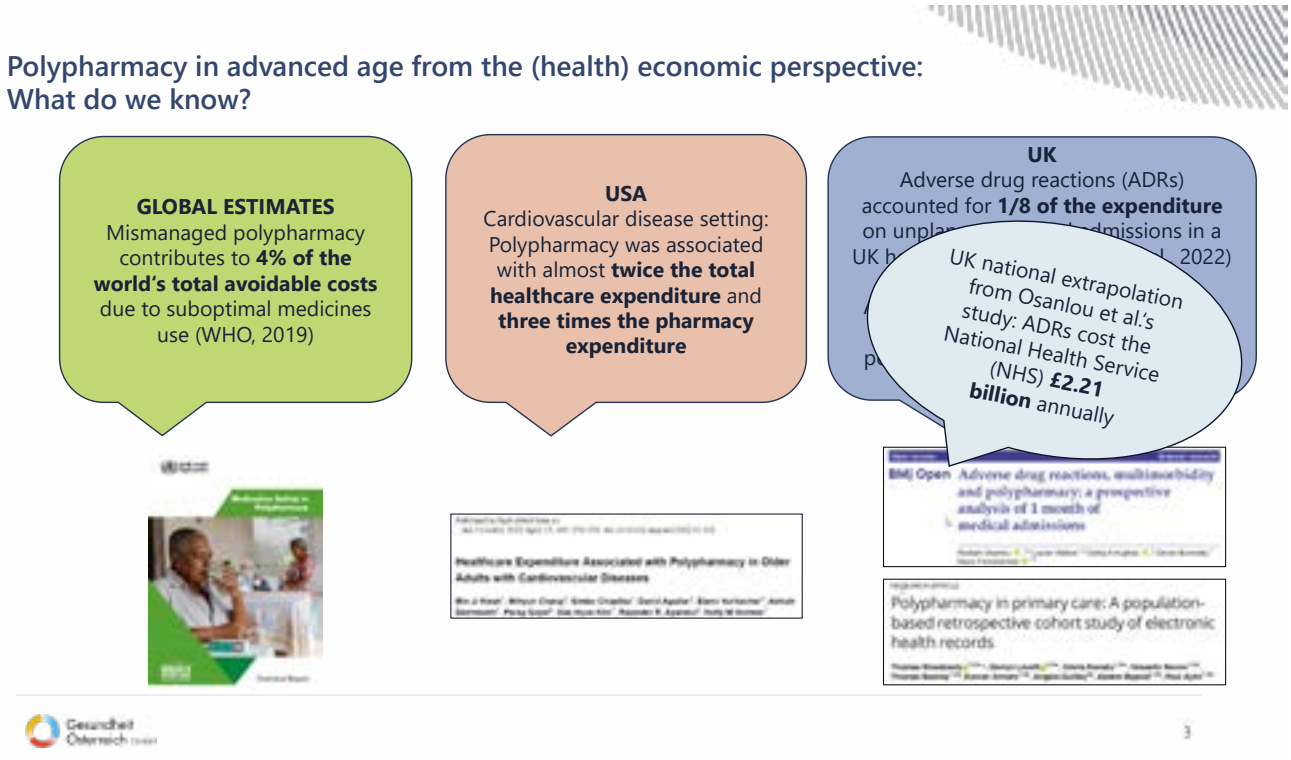
8. Report on Katharina Kieslich's contribution: The Crux of Polypharmacy from a Health Economic Perspective

by Annemarie Spiessberger Mag.[a], Member of the NGO Committee on Ageing, UN Vienna

The charts included in the text had been presented by Dr. Katharina Kieslich during her speech.

Contact: Dr. Katharina Kieslich, Austria katharina.kieslich@goeg.at

Katharina Kieslich, who works in the department of pharmacoeconomics at the Austrian National Public Health Institute, presented important information on the health economic perspectives, including costs related to polypharmacy and its impacts on the health systems. In this context, she explained that providing exact figures on the costs of polypharmacy to health systems is a challenging issue. However, to help the audience understand the cost-impact and cost-effectiveness of interventions to address polypharmacy, she presented recent studies which examined healthcare expenditure resulting from adverse drug reactions caused by suboptimal medication.



The authors of the World Health Organization's report 'Medication Safety in Polypharmacy', Katharina Kieslich said, estimate that polypharmacy is a major cost problem worldwide and constitutes approximately 4% of total avoidable costs due to the inappropriate use of

medication. She also presented some results from a study conducted in the USA, which has looked in particular at older persons with cardiovascular diseases (CVDs) to estimate the association between polypharmacy (taking ≥5 medications per day) and annual healthcare expenditure for these patients. (Kwak at al. 2022, p. 2)

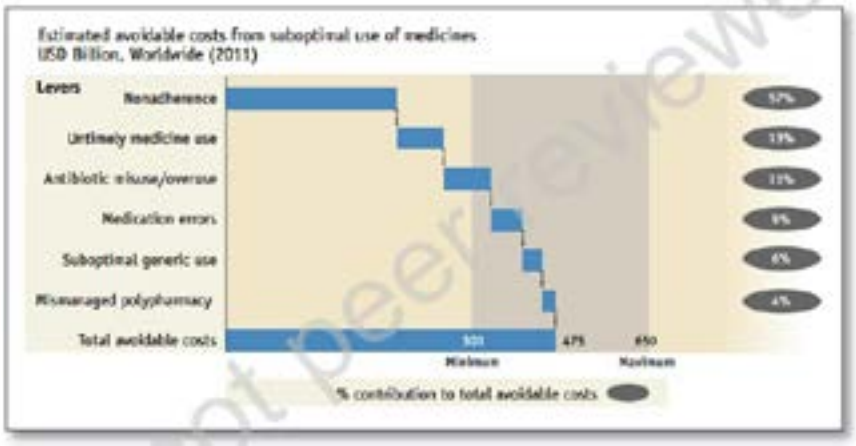
Using suitable statistical methods, the scientists calculated that, among older persons – over 65 years old – with cardiovascular diseases (CVD) and other medical problems, polypharmacy was associated with costs being almost twice as high as the total healthcare expenditure, and three times as high for pharmacy related expenditure compared to patients without polypharmacy (taking <5 medications per day).

Katharina Kieslich explained that healthcare expenditure includes the cost of all medical consultations and treatments as well as accommodation in medical facilities and, of course, all medicines. In her opinion, stating that polypharmacy is associated with three times the pharmacy expenditure is not very helpful, because it is a fact that the more comorbidities a person has, apart from one's cardiovascular diseases, the higher their pharmacy bill will be.

Finally, Katharina Kieslich presented data from a prospective observational study conducted by scientists at the Liverpool University Hospital Foundation, National Health Service (NHS) Trust in England. The study examined the cost burden on patients and healthcare systems over a 1-month period. The study found, that one-eighth of the expenditure of unplanned hospital admissions is related to adverse drug reactions (ADR) due to polypharmacy. For that reason, the scientists wanted to know, what this could mean for the NHS in the UK in general. The researchers estimated that based on data from 2021 adverse drug reactions cost the NHS as much as £2.21 billion annually – a quite substantial amount.

A key question is the following: Can we reduce costs for a health system by reducing polypharmacy? At this point, Katharina Kieslich reflected that polypharmacy is only a small part of what is called the suboptimal use of medicine. Parts of a suboptimal use of medication contains: non-adherence, untimely medicine use, antibiotic misuse/overuse, medication error, suboptimal generic use and mismanaged polypharmacy.

Polypharmacy in advanced age from the (health) economic perspective



Source: IMS Institute for Healthcare Informatics, 2012 (now IQVIA)

It has to be noted that polypharmacy (the use of five or more medications per day) is likely to be included in some of the points listed under “suboptimal use of medicine” and is therefore underestimated in the graph above.

The following table, presented by Katharina Kieslich, shows various important aspects related to morbidity and polypharmacy. They emphasize that there is still insufficient differentiated data to come to clear conclusions, despite the fact that it is well-known that the older population is a particularly vulnerable part of society.

Polypharmacy in advanced age from the (health) economic perspective

- Prevalence of polypharmacy is high but differs substantially between countries: Range of **22.8% in UK** to as high as **58.3% in Germany** (Bennie et al., 2023)
- Highest expenditure on those patients with most medicines and co-morbidities
- Polypharmacy has **health equity implications**: Vulnerable populations and socio-economically deprived population groups are affected
- Studies point to the **overuse of proton pump inhibitors and benzodiazepines**
- **Quantification of economic effect** of polypharmacy in advanced age is **difficult**

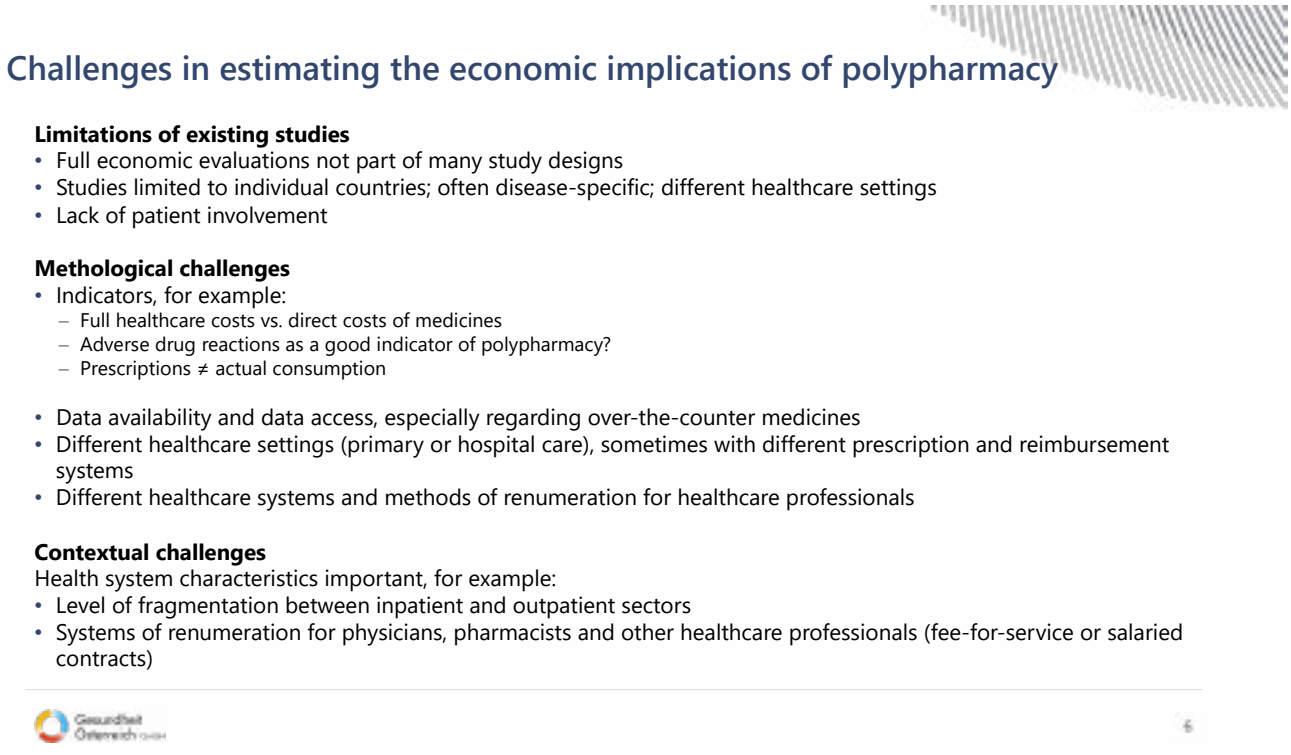
Limits of current knowledge

- Extent of the economic impact of polypharmacy
- Different impact in different countries (low, middle und high income countries)
- Extent of problem in relation to other problems in the area of appropriate use of medicines, for example non-adherence

According to Katharina Kieslich, the problem is not only the cost factor but it is also very much a matter of **health equity,** of which we need to be aware. In that respect, the problem is that older people from socio-economically deprived backgrounds suffer more and are more affected by polypharmacy than elderly from more privileged backgrounds. She said that this is also of great importance from both health and economic viewpoints.

The issue, she said, is that we simply don't know enough to fully quantify the economic impact of the problem, so our data, and therefore our knowledge, is always limited. This is because many studies examining ongoing hospital interventions, for example, addressing polypharmacy, do not incorporate a full economic evaluation into their study design from the beginning.

Therefore, researchers don't actually know what the real economic effect is? What are the savings and do they outweigh the implementation costs?



Katharina Kieslich emphasized, in relation to the challenges and limitations, that economic studies in the healthcare systems are not only very complex but also disease-specific and require economic evaluations at different levels. For example, they may focus on primary care and its follow-up costs, or on inpatient hospital care, taking into account all related costs. Also, studies are mostly limited to individual countries. The next problem is that of data availability. To conduct good studies, you need to have access to good data and the involvement of all concerned parties as well as sound interpretation by the relevant professions after the study has been conducted. Additionally, researchers also need to know how the respective healthcare system is organised.

Cost effectiveness of interventions to address polypharmacy

- Cost effectiveness compares the difference in costs and benefits between interventions (in this case interventions, policies or strategies to address polypharmacy) and relating them to one another
- Interventions to address the challenge of polypharmacy in old age exist, for example: Implementation of **medication reviews** in primary care; **education and awareness campaigns**; **medication recommendations by pharmacologists** in hospital settings
- Evidence suggests a **small (but statistically significant) effect on medication management and reduction of medicines** (Laberge et al., 2021)
- **Cost effectiveness of interventions unclear:** Costs of implemention of interventions seem to offset the cost savings, in some cases benefits outweigh the implementation costs (Laberge et al., 2021)

Gesundheit Österreich

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Katharina Kieslich explained that, based on the evidence so far, medication reviews involving pharmacologists seem to be the most effective approach to address polypharmacy, as has been shown in hospitals. However, it is unclear whether this can be transferred to the primary healthcare sector, or if it only applies to hospitals. The problem lies in not knowing what happens after a patient has been discharged.

In this context, it is important to note that, while interventions have a positive impact on medication management, their cost-effectiveness is unclear as the findings are only based on short-term pilot studies. This makes it difficult for researchers to investigate long-term effects.

Evidence-informed policies to address polypharmacy in advanced aged

- Need for **better evidence**, especially at cross-national level → Research funding?
- Need for **transparent data** to shed light on the complexity of the issue
- Identification of **facilitators and barriers** to implementation
- Interventions with **integrated roadmaps for long-term sustainability** of intervention
- Identification of **leaders and allies**

What are the wider health system trade-offs when one de-prioritises or prioritises certain interventions?

Gesundheit Österreich

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Concluding her contribution, Katharina Kieslich said that, in terms of health economics, she and her colleagues need better study designs and greater access to high-quality, transparent data. Furthermore, researchers must identify the factors that either facilitate or hinder the addressing of polypharmacy issues in clinical settings. Additionally, she emphasized that all studies and policy intervention must have an integrated, long-term approach.

Polypharmacy will stay an important and even growing issue within our ageing society.

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9. Short biographies and abstracts of the speakers

A Geriatric Medicine View - by Thomas Frühwald, Austria

Thomas Frühwald graduated at the Medical University of Vienna, followed by postgraduate training in internal medicine and geriatric medicine in Vienna and Geneva, and courses in medical ethics and palliative care. He is deputy chief of medicine at the Department of Geriatric Acute Care of the Hietzing Hospital, Vienna. He is also lecturer in geriatric medicine and gerontology at the Medical University of Graz and the University of Applied Sciences in Vienna. In 1998 and 2002 he was Visiting Professor at the Department of Bioethics, University of California. Publications on various general topics of geriatrics: nutrition, delirium, geriatric palliative care, ethics in geriatric medicine.

To name a few present functions: Board member of the Austrian Society of Geriatrics and Gerontology, Board member of the European Union Geriatric Medicine Society, member of the advisory group of experts on Geriatric Medicine to the Austrian Federal Ministry of Health, just to name a few.

Abstract: Polypharmacy – a Geriatric Perspective
Multiple medication use (polypharmacy), described as the routine application of more than five medications per day, is common among the older population for ageing carries the risk of multimorbidity. Unwanted drug events may eventually lead to premature deaths. Patients over 65, particularly those living in care homes, are most vulnerable.
The short presentation will address these issues and indicate possibilities of competently dealing with these problems.

The View of a Clinical Pharmacologist – by Martin Wehling, Germany

Martin Wehling, MD, is Professor em. of Clinical Pharmacology at the University of Heidelberg, Germany. He is also a board-certified internist (cardiologist) and has longstanding experiences in basic science (cell physiology, steroid pharmacology, nongenomic steroid actions), clinical trials (translating basic science into human studies) and clinical medicine (invasive cardiology, endocrinology). He has designed the first positive-negative drug labelling approach Fit-for-The-Aged (FORTA) in 2008 and organized the establishment of the FORTA list to aid physicians in ameliorating drug treatment in older people.

Abstract: Polypharmacy Looked at by a Clinical Pharmacologist
To improve pharmacotherapy in older people, many drug listing approaches have been developed, e.g. the Beers or START/STOPP Criteria. So far, the FORTA(Fit-For-The-Aged)-list is the only listing approach that represents a positive-negative drug list identifying both over- and undertreatment (potentially inappropriate medications PIM AND potentially omitted drugs PPO) and that has been clinically validated. In the VALFORTA trial, improvement of ADL and drug side effects (NNT 5) could be demonstrated. Falls were interventionally reduced as well. Addressing PPO has been found to be clinically more important than addressing PIM. The clinical results show that pure deprescribing is no longer sufficient to improve the prognosis of older patients, as “good” drugs often need to be newly prescribed as well. This combination of stopping PIM and prescribing PPO is now called “re-prescribing” which should become the standard for future medication optimization approaches in older patients.

Presenting a Geriatrician's View – by Shelley Ann Sternberg, Israel

Shelley Ann Sternberg MD, FRCPC was born in Hamilton (Ontario), Canada. She is a geriatrician and epidemiologist. Her training was at Harvard University and the University of Pennsylvania, and she was on faculty at the University of Chicago Division of Geriatric Medicine, before moving to Israel in 2001. Her clinical and research interests have included dementia, frailty and medication management in older people. She is the author of numerous papers and publications, and was responsible for the National Dementia Program of Israel while working in the Ministry of Health from 2016-2020. She serves on the National Advisory Committee for Geriatrics and has held senior positions in the Israel Geriatric Society. Presently, she is Director of the Shaare Zedek Memory Clinic affiliated with the Hebrew University, and is Regional Director of Geriatric Services and Clinical Investigator at Israel's second largest health maintenance organization, Maccabi Healthcare Services.

Abstract: Polypharmacy in Israeli Older Adults
Polypharmacy is a growing problem in Israel as the population ages. In the last few years, Israel has reached one million people over 65 accounting for 12% of the population. This rate is expected to double in the next 20 years. Data on polypharmacy in older adults from a national MABAT survey will be presented, as well as data from Maccabi Healthcare Services, Israel's second largest health maintenance organization with over 2 million members. Interventions to address polypharmacy in Israel will also be reviewed.

Presenting an Economic View – by Katharina Kieslich, Austria

Katharina Kieslich works at the Department of Pharmacoeconomics at the Austrian National Public Health Institute. Before joining the Institute, Katharina spent many years researching and teaching at the University College London, King's College London and, most recently, at the University of Vienna. Her expertise includes the politics, economics and ethics of priority-setting in health, comparative studies of health technology assessment systems, affordability of high-priced pharmaceuticals, as well as patient and public involvement in health policy.

She is also involved in capacity building activities on pharmaceutical policy for public stakeholders such as technical experts working on pharmaceutical pricing and reimbursement as well as patient organisations. Katharina has published her research in high impact journals. She holds a PhD in Political Science from the University College London (UCL).

Abstract: The Crux of Polypharmacy from a Health Economic Perspective
Polypharmacy in old age is a clinical, societal and economic concern. Evidence suggests that polypharmacy in elderly populations can lead to higher rates of patients needing outpatient care as well as higher rates of hospitalizations due to adverse drug events (ADEs). While this has potential economic implications for healthcare systems, the relationship between polypharmacy, healthcare utilization and costs still holds questions. This talk will provide a brief overview of the available evidence of the effects of polypharmacy on healthcare expenditures and the cost effectiveness of interventions to reduce the potential harms of polypharmacy. It will conclude by offering insights into policy instruments that may prove effective in alleviating the negative consequences of polypharmacy.

10. Organisations which supported the conference

NGO Committee on Ageing, UN Vienna (CoA)

The Conference of NGOs in Consultative Relationship with the United Nations (CoNGO)

European Federation of Older Persons (EURAG)

International Federation of Business and Professional Women (IFBPW)

Women's Federation for World Peace (WFWP)

International Federation on Ageing (IFA)

Soroptimist International (SI)

Society for the Advancement of Global Understanding (VfV)

Women's International Zionist Organisation (WIZO)

Graduate Women International (GWI)

European Federation of Older Students in Universities (EFOS)

NGO Committe on Sustainable Development Vienna (CSD)

International Inner Wheel (IIW)

International Council of Jewish Women

International Council of Women Conseil International Des Femme (ICW-CIF)

International Association of Gerontology and Geriatrics (IAGG)

Unity of Pensioners of Slovakia, MO JDS Bratislava IV

Federal Ministry Republic of Austria

NGO Committee on the Status of Women Vienna

Servas International

Zonta International