



With a little help from my (neighbouring) friends. ‘Border region patient mobility’ in the European Union: A policy analysis

Markus Frischhut^a, Rosella Levaggi^{b,*}

^a Jean Monnet Professor and Study Coordinator European Union Law, Management Center Innsbruck, Universitaetsstrasse 15 6020 Innsbruck Austria

^b Department of Economics and Management, University of Brescia, Via San Faustino 74b 25122 Brescia Italy

ARTICLE INFO

JEL:

H51

I18

K32

Keywords:

EU

Border region

Patient mobility

ABSTRACT

Increased disparities in income and health care expenditure across EU countries may lead to an increase in patient mobility, which may, in turn, call for more action by the EU and its Member States. At present, patient mobility (or cross-border healthcare) is still a marginal phenomenon but is deemed to increase in the future. In this paper we examine border region patient mobility, defined as patients receiving care in a neighbouring country within a certain proximity. We examine, with the use of a spatial competition model, the options used to regulate such a patient flow and their welfare implications, both for patients and Governments. We show that marginal price costing would lead to an increase in patient welfare, whilst reducing the risk of increasing cost for the exporting country.

At present there seems to be an East/West difference in the way these flows are regulated. In order to increase equity, we suggest that a ‘joint implementation’ of EU Directives by neighbouring Member States, especially in the field of cross-border healthcare, would allow Member States to define target populations (in terms of type of care and distance travelled) that could allow more freedom in terms of border care, without increasing health care expenditure. A future combination of the two existing legal frameworks in this field would also be more user- or patient-friendly.

1. Background

The creation of an enlarged European Union (EU) has increased cross-country disparities in income, life expectancy, efficiency in public spending and available technologies [1,2]. This may lead to an increase in patient mobility. The EU is already active on this front, but its role could become even more prominent in border region mobility, which we define as patients receiving care in a neighbouring country within a certain proximity. A precise definition in terms of a specific number of kilometres is not possible as the existing (road) infrastructure plays a key role.

After long-standing rules on social security coordination, the EU has focused on a patient’s right to receive medical treatment in another Member State with Directive 2011/24/EU [3] and patient mobility has been rising steadily since 2016 [4–6]. However, this is still a marginal phenomenon because patients goals may not be compatible with the objectives and constraints of their own national healthcare planners [7, 8]. Some evidence shows that resident patients may have benefited both because rules are more transparent and because national health care

systems have improved provision to reduce such mobility [9–11], but it is still not clear which are the long-run effects of such mobility and whether it may be sustainable [12–14].

In this paper we focus on (planned) ‘border region mobility’, whose flow is, at present, regulated using several methods. We will focus especially on whether and under which conditions it might be possible to improve patient welfare in border regions using EU instruments already in place, without reducing healthcare access for the rest of the population. This question is quite relevant from a policy point of view since it is estimated that about 40 % of the EU population live in a border region [15].

We present a theoretical framework that allows the problem to be studied and policy implications to be derived, both on the price and the organisation structure for such mobility. We suggest that a joint implementation of EU directives by neighbouring Member States may allow specific targets of patients, defined by Member States on the distance to the closest provider, to travel more freely across borders while the EU could play a prominent role with regard to price regulation and possibly in reducing cost disparities arising from Purchasing Power

* Corresponding author.

E-mail addresses: markus.frischhut@mci.edu (M. Frischhut), rosella.levaggi@unibs.it (R. Levaggi).

<https://doi.org/10.1016/j.healthpol.2024.105114>

Received 15 April 2024; Received in revised form 13 June 2024; Accepted 13 June 2024

Available online 21 June 2024

0168-8510/© 2024 The Author(s). Published by Elsevier B.V. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

Parity (PPP) differences.

2. Patient mobility across borders

Patient mobility across neighbouring regions arise for several reasons [16–18]. The first one is related to work arrangements: individuals commute to another country and are treated in the country where they work. This is true for the Benelux area, where working across borders is quite common, and in some areas of France, Germany, Austria and Eastern Europe. In this case, patient mobility derives mainly from a disparity between the country of residence and the one where healthcare contributions are usually paid.

Mobility may also originate because of historical reasons, as in the case of the split of Czechoslovakia into two separate countries [4]. This mobility may decrease over time, since new patterns may emerge, unless other reasons, such as language or proximity, are more important in the long run.

Finally, cross-border mobility can derive from proximity: when the closest healthcare provider is across the border. In some areas such mobility is well developed, as in the Meuse-Rhine border, where a flow of patients, mostly originating from Germany, go to the Netherlands, and in the Benelux area. The same is true for individuals living in South Tyrol (Italy) who travel to North Tyrol (Austria) to receive healthcare. For Lower Austria/South Bohemia/Slovakia, although all types of care are accessed, the focal point is around maternal and neonatal care. The flow between Poland and Czech Republic mostly derives from Poland sending their patients to Czechia, while mobility between other areas is often less developed [4,19,20].

For work-related mobility, the rules provided by Article 20 of the regulation on social security coordination (SSCR) [21] allow patients using the S1 form to receive care in the country they prefer in a rather uniform way across Europe. The same is not true for other types of border mobility as shown below.

Planned care originally only took place under the SSCR until, in the *Kohll* case [22], the ECJ also enabled planned cross-border healthcare under the freedom of services provision (Art. 56 TFEU), now summarised in Directive 2011/24/EU on the application of patient rights in cross-border healthcare (PMD). Hence, patients living in the 27 EU-MS and the EEA/EFTA countries now enjoy at least two possibilities to seek planned treatment abroad under the EU rules.

- Article 20 SSCR is concerned with the rights of an insured person travelling to another country with the purpose of receiving benefits in kind during their stay. It basically always requires prior authorisation, embodied in the S2 form. This is also the way to choose to receive care in Switzerland and the UK. For further details, see Appendix A.
- Directive 2011/24/EU, which, like every EU directive, had to be implemented into domestic law. Sometimes the PMD requires prior authorisation but not under all circumstances. Patients are reimbursed the lower cost of what they pay for healthcare abroad and what would be reimbursed to their national provider for the same treatment.

Finally, some countries have stipulated (bilateral) agreements that allow patient flows across borders with less bureaucracy (and cost) than that foreseen by EU law.

At present, there seems to be an East/West division in the predominant way to regulate border mobility. In Western Europe, agreements prevail while in Eastern Europe, EU rules are typically used. Several agreements regulate flows between Germany and the Netherlands, in the Benelux and Meuse-Rhine region and the Italian-Austrian border region [4]. Based on the primacy of EU law over conflicting domestic law, these agreements provide additional rights for patients within these border regions but do not restrict existing ones.

The flows across Eastern countries and those towards Western ones

are, instead, mostly regulated through the PMD and the SSCR, usually with more barriers to movement [5,19,20,23]. In what follows, we present a simple model that allows this problem to be studied both from a patient's and a governmental point of view to show where welfare gains are possible [4,5,24].

3. Methods

We study border region mobility with a very simple model, borrowed from spatial competition (See [25] for a review). A population, normalised to 1, is distributed uniformly along a line of length 1 and needs health care. Two providers, charging a price, p_A and p_B respectively, are positioned at the extremes of the line. Healthcare is free at the point of use, i.e. patients do not pay for care directly (either because it is funded by a public provider or by private insurance). To move to their preferred provider, they must bear travel costs m , which are assumed to be proportional to the distance. Quality of care is denoted by q , while the cost may differ across providers. Patients receive a fixed benefit, v , from being treated and a variable part, which depends on quality. We denote with $\phi > 0$ such an evaluation. We show the choice for a generic patient using Fig. 1.

On the horizontal axis, we depict the community and the position of the patients. Two providers are located at the two extremes (0 and 1). Let us consider the choice of the individual located at x .

The utility they receive by being treated is equal to $v + \phi q$, while the cost depends on their location. In this case, since the travel cost is proportional to the distance, they will go to the closest provider.

The presence of a third payer (an insurance company or a public provider) creates fiscal illusion, i.e. patients do not take costs into account in the choice of their preferred provider. Let us now assume that at point $y > \frac{1}{2}$ there is a border so that patients on the line $[0, y)$ are resident in country A and the rest $(y, 1)$ are resident in country B. Under EU rules, border provision is possible at an extra cost, $2z$. $2z$ is a proxy for searching, administrative costs, waiting time (for the PMD, this also includes the difference between p_A and p_B). This cost may be sensibly reduced by an agreement.

Consumer decisions (whether free or bounded by some restrictions) determine the level of utility that they receive from health care. The sum of their utilities is our measure of consumer welfare, which corresponds to (gross) consumer surplus.

4. Government objectives

A government will fund care for its population. Quality is set outside the model to q ; the cost to provide healthcare in each country consists of a fixed cost, F_i , and a variable cost, c_i , i.e. $C_i = F_i + c_i * d_i$ where d_i is the number of patients in each country (in our case $d_A = y$ and $d_B = [1 - y]$). This is the benchmark on which the pros and cons of patient mobility can be evaluated. We assume that a government wishes to maximise welfare, which is given by the difference between (gross) consumer surplus and expenditure.

5. Benchmark

Let us consider a benchmark situation where mobility is ruled out and at $y > \frac{1}{2}$ there is a border. Patients living in country B go to their first-choice provider as shown in Appendix B, as well as patients living in the segment $\left(0, \frac{1}{2}\right)$ of country A. Patients living in the segment $\left(\frac{1}{2}, y\right)$ would prefer the provider located at 1 (which supplies the same quality of care but is closer), but they are not allowed to go there. They can go to the provider at 0 or they can decide not to be treated and their choice depends on the patient's evaluation of healthcare and travel cost as shown in Appendix B. Gross consumer surplus is shown in Fig. 2.

On the horizontal axis, we measure the position of the consumers on

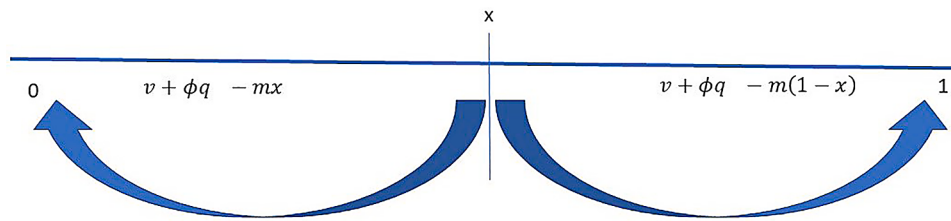


Fig. 1. Choice if patient located at x .

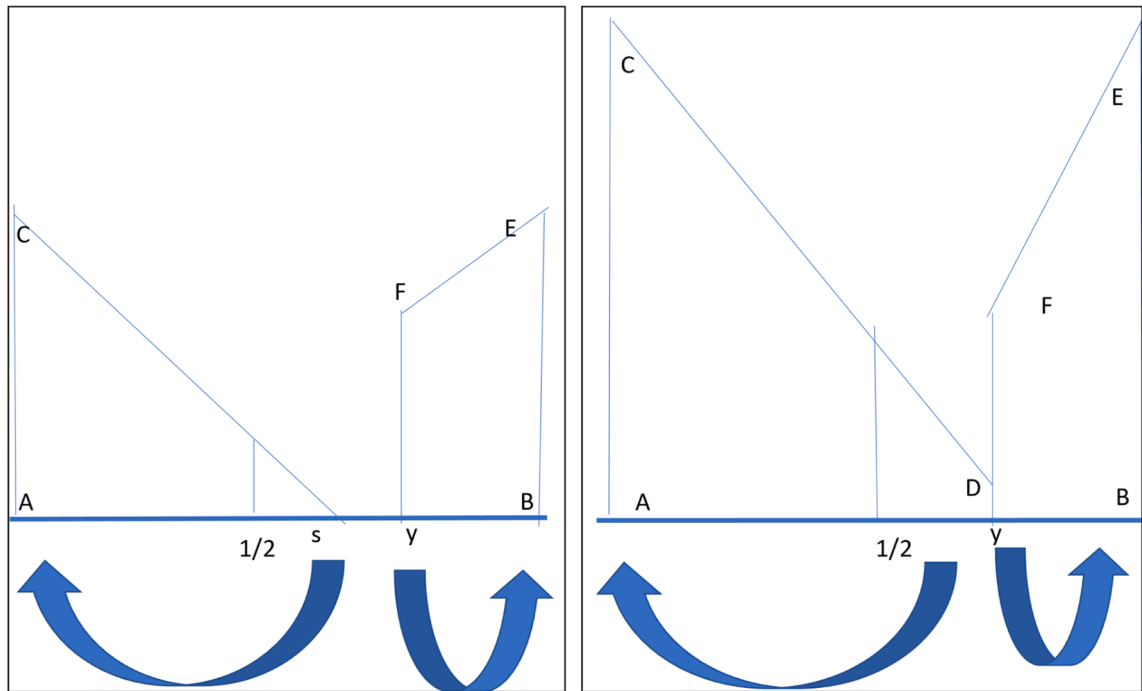


Fig. 2. Welfare when mobility is not allowed.

the line between 0 (where the first provider is located in country A) and 1 (where the second provider is located in country B). On the left-hand side of Fig. 2, the level of willingness/ability to pay for quality is relatively low and some individuals decide not to seek treatment because of the distance involved (those in the area (s, y)). The line Cs records, for each consumer receiving care from the provider at 0, their net utility, which is decreasing because of the travel cost. The line FE measures utility for consumers treated by the provider at 1. The sum of the net utilities is the (gross) consumer surplus, which corresponds to the area $(A-C-s) + (y-F-E-B)$. In the second case (the right-hand side of Fig. 2), v is sufficiently high to get the market fully covered and welfare becomes $(A-C-d-y) + (y-F-E-B)$. From this benchmark solution, let us see what the implications are of agreements and EU rules for patient mobility.

6. Patient mobility under EU rules

EU regulations allow citizens to receive care in another EU country, if they are willing to pay an extra cost equal to $2z$. In Appendix B we show that patients in the segment $(y, 1)$ and $(0, \frac{1}{2})$ will receive care from their domestic provider with the same level of utility enjoyed in the benchmark case. Let us assume that v is sufficiently high for the market to be fully covered (as in Fig. 2, right-hand side); patients in the area $(\frac{1}{2}, y)$ face two alternatives: they can go to their domestic provider, or they can choose the provider abroad for an extra cost equal to $2z$. The indifferent

patient is located in $\frac{1}{2} < k < y$, i.e. patients in the segment $(\frac{1}{2}, k)$ go to the domestic provider, while the ones on the line (k, y) choose to be treated abroad. The position of k depends on the level of z relative to m . In fact, for $z = 0$, $k = 1/2$ and travelling cost are minimised, for $z \geq \frac{1}{2}(2y - 1)m$ $k = y$, i.e. patients do not move across the border. Consumer surplus in this case is equal to $(A-C-d-k) + (k-G-F-E-B)$ as shown in Fig. 3.

This solution is a welfare improvement with respect to the benchmark, but it is not optimal because of the extra cost, $2z$.

In our model, the optimal solution would be represented by an environment where patients could choose their provider, independently

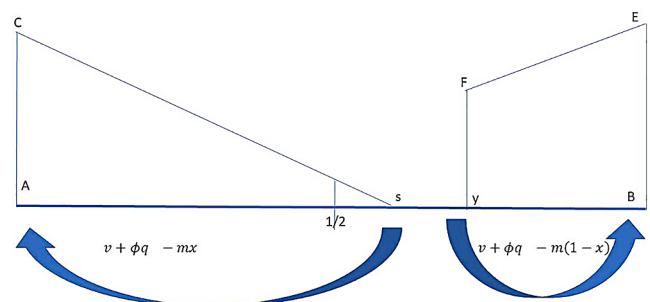


Fig. 3. Patient mobility under EU rules.

of the country in which they live. In this case, patients would split equally between the two providers and the indifferent patient would be at $\frac{1}{2}$. Consumer surplus (gross of the cost to provide healthcare) is presented in Fig. 4, while the algebraic derivation is presented in Appendix B.

The sum of the net utilities is the (gross) consumer surplus, which is measured by the areas below the two lines, i.e. $A-C-d-F + F-d-E-B$. However, this solution does not consider the cost involved in choosing a provider other than the domestic one and may not be sustainable from an economic point of view. In what follows, we examine the different cases.

7. Results

Governments are, in general, reluctant to allow free patient choice, especially across borders, because this freedom may reduce efficiency and jeopardise expenditure sustainability. Healthcare often requires long-term investments; if patients can freely choose providers abroad, the uncertainty on the capacity required may lead to over/under capacity. To balance governmental objectives with patient aspirations, the EU has set rules allowing governments an important degree of control over patient choice, especially when prior authorisation is required. However, from an economic point of view, there might be some cases where free mobility may be in line with an improvement in welfare.

Let us first analyse in which case patient mobility would certainly be beneficial, both from a governmental and a patient's point of view. We can identify two separate cases: (i) Pareto improvements: patient utility increases without any extra cost for the government, and (ii) welfare improvements: the increase in patient utility is higher than the extra cost borne by the government. For patients, the measure used is gross consumer surplus, while for the government it is expenditure and for the community it is gross consumer surplus.

In Appendix B, we show the two conditions for which border mobility is a Pareto improvement:

1. there are no fixed costs ($F_i = 0$) and $c_B < c_A$.
2. Treatments are priced at marginal cost and if $c_B < c_A$.

which are rather stringent conditions. When the benefits for patients outweigh the increased expenditure, patient mobility may still be allowed. In this case, the government should evaluate the net consumer gain (given by the difference between consumer surplus and expenditure) against the benchmark when mobility is not allowed. As shown in Appendix B, it is possible to determine a price ceiling for which mobility is improving welfare in country A by finding the price for which the net consumer surplus against the benchmark and when mobility is allowed are the same. In Appendix B, we show that this price is equal to $p_B = c_A + m\left(y - \frac{1}{2}\right)$, which is higher than that for a Pareto improvement and depends on the distance and the transport costs.

When these conditions are not met, from a welfare point of view, it makes sense to evaluate each case separately as the EU rules suggest.

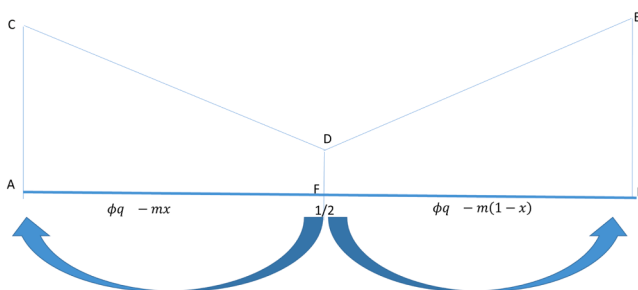


Fig. 4. First best choice of preferred provider and consumer surplus.

8. Discussion

When patient mobility does not create extra cost for a government, allowing patients to move without prior authorisation would be the best option for the government, even though also in this case some regulation is needed to avoid imbalances between demand and supply. This could be implemented within EU rules or through an agreement between the two countries. Under the PMD, it is already possible to move abroad without prior authorisation and if the price is not higher than that in the country of residence then there is no extra cost involved. Agreements and the PMD have comparative advantages and disadvantages. Agreements regulate patient flows beyond EU rules and may create further confusion in a patient's mind [15], in addition to all the other already existing possibilities under EU law, but they might reduce uncertainty in forecasting capacity for healthcare providers and additional benefits also with respect to PMD. In fact, although the PMD allows governments to have patients treated abroad for the same price as that in the resident country, this does not necessarily imply that expenditure is the same. In most countries the providers are reimbursed using a price that fully compensates the variable costs and a part of the fixed ones [26]. The fixed cost part needs to be set by forecasting the number of patients that will be treated; this implies that, if a lower number of patients are treated (because some choose to be treated abroad), the fixed costs will not be fully compensated and this may explain why Government are still reluctant to let patients move freely even if they pay the extra cost. In the example above, if country A sets its price in this way $p_A = c_A + \frac{F_A}{y}$ then the fixed costs are only covered if all the y patients are treated in country A or if the price of mobility is not higher than c_A . This is the reason why, in the conditions above, the price at which welfare improves is set in terms of marginal costs. This is the first policy recommendation. The EU could invite governments to regulate border mobility flows using marginal rather than full costs. This implies that the numbers of patients treated abroad are also going to be compatible with the existing capacity of the receiving country and may not generate competition between the two health care systems.

The use of the S2 form (i.e. prior authorisation for planned care under the SSCR) allows patients to receive care for free, which, however, could be delayed due to the prior authorisation requirement. The rationale for its use could be related to equity issues (N.B. the PMD allows for both situations requiring prior authorisation and other situations, where this requirement does not exist). Under the PMD, patients must pay up-front and they are reimbursed the lower cost of the price paid abroad and the domestic price, which may lead to a situation in which only more well-off individuals may have this opportunity. In deciding whether to allow patients to use this option, a Member State could evaluate both patient mobility and the difference in expenditure, as shown in the previous paragraph. The gain for patients in receiving treatment abroad is inversely related to the distance to the border and, with the S2 form, a government could allow patients who live closer to the border to be treated without any further cost (for example by defining sub-regions where patients are allowed to move abroad). The use of the PMD and prior authorisation is somehow the more restrictive case: patients have to ask before travelling abroad and, even if authorised, may have to pay extra costs.

Normally, under EU law, each country has to implement an EU directive individually into its legal system so that actual rules may be slightly different across countries. For border regions, we propose a 'joint implementation'. The idea is that the implementation of the PMD is coordinated between the two (eventually even more) Member States of a border region. In doing so, Member States could also use bilateral agreements, where countries define the target population that might use these rules. These rules have to be more beneficial to patients than EU law. In setting up such an agreement, each country should define the target population through an analysis of the distance (in terms of travelling time in order to take into account infrastructure as a natural

barrier) between domestic and cross-border providers. For these individuals, the rules for being treated abroad could be less strict (in terms of prior authorisation and out-of-pocket payment) and the agreements could also foresee some thresholds in terms of number of users. In this way, both countries could better shape their supply to demand and reduce excess capacity. A review through time of the agreement may allow taking into account technological innovation (which may change capacity) and it will also allow to shape capacity in both countries to demand in order to make these mobility flows sustainable in the long-run. Prices should be determined using marginal price rules for the reasons explained above. Although it is true that the PMD deadline has already expired, we understand ‘implementation’ as a continuous improvement of the objectives of the PMD. In addition, this implementation can pertain both to the legislative and to the administrative branch of power.

At present, there seems to be an East/West division in the predominant way to regulate this type of mobility. In Western Europe, agreements prevail while in Eastern Europe, EU rules are typically used. This sharp difference may depend on healthcare funding, but also on price differences. On average, income and the price level in Western Europe are higher than in Eastern Europe, especially if Purchasing Power Parities (PPPs) are not considered. According to Eurostat [27,28] in 2022 the PPP index (with a benchmark of 1 for EU countries) was quite similar for Austria, Germany and France (109–110), but was much lower for Eastern countries (86–89) and this may sharply reduce incentives to stipulate agreements or to allow patients to move under the S2 form. For the PMD, patients having to pay the difference between the price charged abroad and the domestic cost may represent a serious barrier to move. When PPPs are quite different, one possible way could be to think about a form of EU subsidy to cover the price difference arising from this element.

9. Conclusions

Health care systems across Europe still rely on domestic rules for their governance and service delivery and they also seem to be rather closed to external influences, as Member States are traditionally reluctant to cooperate or shift additional competences to the EU. After the Covid-19 outbreak, there does seem to be more scope for EU intervention in the health care market [29]. During the pandemic, the EU acted as a central provider of vaccines [30] and it certainly contributes to innovation through specific funding for rare and non-communicable diseases [31,32]. The EU may play a prominent role in the regulation of healthcare [33–35] and in planning spare capacity to face unexpected crises [1,30], thereby increase resilience and sustainability, as also foreseen in the concept of the ‘European Health Union’.

While patients’ free mobility across countries may not be sustainable both from an efficiency and political point of view, an area where the EU could be more active is border region patient mobility, where the flow may be justified by geographical location of the provider. Given that it is estimated that about 40 % of the European population live in a border region [15], about half of the EU population may receive benefits from this intervention. ‘Border region mobility’, as we suggest, could help improve patient welfare in border regions using EU instruments already in place (the PMD and the SSCR). This ‘border region mobility’ would not be driven by individual patients but organised by Member States (in bilateral agreements) and based on solidarity and to the benefit of (vulnerable) patients. From an economic perspective, this might work, especially in border regions with similar PPPs. From a legal perspective, a ‘joint implementation’ can help to enable more beneficial treatment for patients in such a locally pre-defined area.

This ‘joint implementation’ can draw on the advantages of both the PMD and the SSCR. As is already possible under the PMD, Member States could waive prior authorisation. On the other hand, the SSCR could serve as a role model for avoiding the necessity of a patient’s up-front payments. All of this is already possible under existing EU law. In the

long run, this ‘joint implementation’ can allow to shape capacity to demand in order to make expenditure more sustainable. However, in the future, these two legal documents could be merged into one, to reduce complexity for patients and to further enhance this solidarity-based patient mobility. It is worth briefly mentioning that, in February 2022, the European Parliament asked for “a holistic revision” of the PMD and the SSCR [36]. However, in May 2022, the Commission just referred to guidelines and a workshop and did not really take up this idea [37].

Specific patterns and agreements have emerged over time, but, in other cases, barriers still exist to the exploitation of the potentials of border mobility. Our proposals can improve access to care, reduce unmet need indicators and promote an efficient use of resources. In this paper, we have shown under which conditions such mobility could be considered welfare improving. We have also shown that using marginal price cost, rather than some form of full cost, may be more appropriate in order to allow Member States to keep their budget under control and to pay their domestic fixed costs.

Funding/support

The present work is part of the research activity of the project FLASH, funded by the European Union (Grant Agreement 101095424). Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or the “European Health and Digital Executive Agency” (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

Financial disclosure

None to report.

Ethical approval

Not applicable.

CRedit authorship contribution statement

Markus Frischhut: Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Rosella Levaggi:** Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

None to report.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.healthpol.2024.105114](https://doi.org/10.1016/j.healthpol.2024.105114).

References

- [1] Buso M, Bordinon M, Levaggi R, Turati G. The coordination in European Union healthcare after Covid-19. In: Costa-Font J, Batinti A, Turati G, editors. *Handbook on the political economy of health systems*. Edward: Elgar Publishing Limited; 2023. p. 70–85.
- [2] CIFREL. Improving the quality of public spending in europe - Budgetary “waste rates” in eu member states - Think Tank. EU Think Tank; 2020. https://www.europa.eu/thinktank/it/document.html?reference=EPRS_STU%282020%29654197 (accessed March 26, 2021).
- [3] European Parliament and Council. Directive 2011/24/EU of the European parliament and of the council of 9 March 2011 on the application of patients’ rights in cross-border healthcare. 2011.
- [4] Mullan C, Wilson P, Guillermo-Ramirez M. Cross-border patient mobility in selected EU regions. <https://Health.Ec.Europa.Eu/Publications/Cross-Border-Patient-Mobility-Selected-Eu-Regions.en>; 2022. <https://doi.org/10.2875/603558>.
- [5] Olsson J., De Smedth Lynn, De Wispelaere Fredric. Data on patient mobility under Directive 2011/24/EU - Trend report reference years 2018-2020. 2021.

- [6] Peralta-Santos A, Perelman J. Who wants to cross borders in the EU for healthcare? An analysis of the Eurobarometer data in 2007 and 2014. *Eur J Public Health* 2018; 28:879–84. <https://doi.org/10.1093/eurpub/cky071>. Oxford University Press.
- [7] Frischhut M, Levaggi R. Patient mobility in the context of austerity and an enlarged EU: the European court of justice's ruling in the Petru case. *Health Policy (New York)* 2015;119:1293–7. <https://doi.org/10.1016/j.healthpol.2015.07.002>.
- [8] Amuedo-Dorantes C, Rivera-Garrido N, Vall Castelló J. Reforming the provision of cross-border medical care: evidence from Spain. *Health Econ* 2022;31:859–76. <https://doi.org/10.1002/hec.4481>.
- [9] Azzopardi-Muscat N, Aluttis C, Sorensen K, Pace R, Brand H. The impact of the EU Directive on patients' rights and cross border health care in Malta. *Health Policy (New York)* 2015;119:1285–92. <https://doi.org/10.1016/j.healthpol.2015.08.015>.
- [10] Azzopardi-Muscat N, Baeten R, Clemens T, Habicht T, Keskimäki I, Kowalska-Bobko I, et al. The role of the 2011 patients' rights in cross-border health care directive in shaping seven national health systems: looking beyond patient mobility. *Health Policy (New York)* 2018;122:279–83. <https://doi.org/10.1016/j.healthpol.2017.12.010>.
- [11] Nordeng Z, Veggeland F. The implementation of European Union (EU) rules on cross-border care: moving towards convergence? *Health Econ Policy Law* 2020;15: 141–59. <https://doi.org/10.1017/S174413311800035X>.
- [12] Brekke KR, Gravelle H, Siciliani L, Straume OR. Patient choice, mobility and competition among health care providers. *Dev Health Econ Public Policy* 2014;12: 1–26. https://doi.org/10.1007/978-88-470-5480-6_1.
- [13] Brekke KR, Levaggi R, Siciliani L, Straume OR. Patient mobility, health care quality and welfare. *J Econ Behav Organ* 2014;105:140–57. <https://doi.org/10.1016/j.jebo.2014.04.025>.
- [14] Brekke KR, Levaggi R, Siciliani L, Straume OR. Patient mobility and health care quality when regions and patients differ in income. *J Health Econ* 2016;50:372–87. <https://doi.org/10.1016/j.jhealeco.2016.05.003>.
- [15] European Commission. Report from the commission to the European parliament and the council on the operation of directive 2011/24/EU on the application of patients' rights in crossborder healthcare. 2022.
- [16] Glinos IA, Doering N, Maarse H. Travelling home for treatment and EU patients' rights to care abroad: results of a survey among German students at Maastricht University. *Health Policy (New York)* 2012;105:38–45. <https://doi.org/10.1016/j.healthpol.2011.12.008>.
- [17] Glinos IA, Baeten R, Helble M, Maarse H. A typology of cross-border patient mobility. *Health Place* 2010;16:1145–55. <https://doi.org/10.1016/j.healthplace.2010.08.001>.
- [18] Legido-Quigley H, McKee M, Glinos I, Baeten R. Patient mobility in the European Union. *Br Med J* 2007;334:188–90.
- [19] Olsson J., Smedt L De, Wispelaere F De. Data on cross-border patient healthcare following Directive 2011/24/EU for reference year 2021. 2023.
- [20] EU Publications Office. Cross-border healthcare in the eu under social security coordination : reference year 2021. Publications Office of the European Union; 2023. <https://doi.org/10.2767/67056>.
- [21] European Parliament and Council. Regulation (EC) No 883/2004 of the European parliament and of the council of 29 April 2004 on the coordination of social security systems. 2004.
- [22] ECJ judgment of 28 April 1998. In Case C-158/96, REFERENCE to the court under article 177 of the EC treaty by the Cour de cassation (Luxembourg) for a preliminary ruling in the proceedings pending before that court between raymond Kohll and Union des Caisses de Maladie 1998;4.
- [23] EU Publications Office of the European. Cross-border healthcare in the Eu under social security coordination : reference year 2020. Publications Office of the European Union; 2022. <https://doi.org/10.2767/714637>.
- [24] Glinos IA, Baeten R, Maarse H. Purchasing health services abroad: practices of cross-border contracting and patient mobility in six European countries. *Health Policy (New York)* 2010;95:103–12. <https://doi.org/10.1016/j.healthpol.2009.11.016>.
- [25] Levaggi L, Levaggi R. Spatial competition models in health care markets: a review. *Rev. Industr. Organisat.* 2024.
- [26] Levaggi R, Moretto M, Pertile P. Two-part payments for the reimbursement of investments in health technologies. *Health Policy (New York)* 2014;115:230–6. <https://doi.org/10.1016/j.healthpol.2013.10.006>.
- [27] Eurostat. Key figures on Europe –2023 edition. 2023. <https://doi.org/10.2785/494153>.
- [28] Eurostat. Purchasing power parities. 2023.
- [29] Frischhut M. A European Health Union. *Zeitschrift Für Öffentliches Recht* 2023;78: 177–201. <https://doi.org/10.33196/ZOER202302017701>.
- [30] Pircher B. EU public procurement policy during Covid-19: a turning point for legitimate EU governance? *Politics Governance* 2022;10:131–42. <https://doi.org/10.17645/pag.v10i3.5295>.
- [31] Directorate-general for health and food safety. Factsheet - EU action on rare diseases. 2023.
- [32] Directorate-General for Health and Food Safety. Europe's Beating Cancer Plan supporting actions to reduce inequalities. 2023. <https://doi.org/10.2875/114537>.
- [33] Schmidt AE, Bobek J, Mathis-Edenhofer S, Schwarz T, Bachner F. Cross-border healthcare collaborations in Europe (2007–2017): moving towards a European health union? *Health Policy (New York)* 2022;126:1241–7. <https://doi.org/10.1016/J.HEALTHPOL.2022.10.011>.
- [34] Guthmuller S, Paruolo P, Verzillo S. Positive externalities of EU actions on sustainability of health systems. *Contribut Econ Anal* 2021;295:1–21. <https://doi.org/10.1108/S0573-855520210000295006/FULL/EPUB>. Emerald Group Holdings Ltd.
- [35] Commission E, for Health d-G, Safety F, Röhrling I, Habimana K, Groot W, et al. Study on cross-border cooperation – capitalising on existing initiatives for cooperation in cross-border regions – cross-border.care – final report. Publications Office; 2018. <https://doi.org/10.2875/825256>.
- [36] European Parliament. European Parliament resolution of 16 February 2022 on strengthening Europe in the fight against cancer – towards a comprehensive and coordinated strategy (2020/2267(INI)). 2022.
- [37] European Commission. Commission report on the operation of directive 2011/24/EU on the application of patients' rights in cross-border healthcare: COM(2022) 210 final. 2022.