BMJ Open

# Key factors influencing the prescribing of statins: a qualitative study among physicians working in primary healthcare facilities in Indonesia

Sylvi Irawati ,[1,2,3] Sari Prayudeni,[4] Riris Rachmawati,[5] I Wayan Wita,[6] Bob Willfert,[1,7] Eelko Hak,[1] Katja Taxis[1]

**To cite:** Irawati S, Prayudeni S, Rachmawati R, *et al*. Key factors influencing the prescribing of statins: a qualitative study among physicians working in primary healthcare facilities in Indonesia. *BMJ Open* 2020;**10**:e035098. doi:10.1136/bmjopen-2019-035098

► Prepublication history for this paper is available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2019-035098).

SI and SP are joint shared authors.

Received 18 October 2019
Revised 03 February 2020
Accepted 13 May 2020

Check for updates

© Author(s) (or their employer(s)) 2020. Re-use permitted under CC BY. Published by BMJ.

For numbered affiliations see end of article.

**Correspondence to**
Sylvi Irawati; s.irawati@rug.nl

## ABSTRACT

**Objectives** To elicit key factors influencing physicians' decision to prescribe statins.

**Design** A qualitative study using a phenomenological approach within a pragmatism interpretive framework. A combination of purposive and snowball sampling was used to recruit physicians. Data were collected through face-to-face, semistructured interviews with physicians working in primary healthcare facilities in a capital of a province in Indonesia. We recorded and verbatim transcribed the interviews. Coding was done independently by two researchers and data were analysed using phenomenological data analyses. Key factors influencing physicians' decision to prescribe statins were classified into factors at the microlevels, mesolevels and macrolevels according to the structural model by Scoggins *et al*.

**Participants and setting** Physicians working in primary healthcare facilities in a capital of a province in Indonesia.

**Results** Ten physicians were included in the study. Key factors at the microlevel were that physicians knew guidelines in general, but there was uncertainty how to take into account the level of total cholesterol in combination with other cardiovascular risk factors such as diabetes and hypertension. At the macrolevel, the new National Health Insurance System (NHIS) that appeared to facilitate the prescription of statins though more clinical information should be integrated in the system's platform to support appropriate prescribing.

**Conclusions** The findings indicate lack of awareness of specific details in current guideline recommendations. Appropriate prescribing of statins should be enhanced using the new NHIS.

## Strengths and limitations of this study

- This is the first study to gain insights from physicians on key factors influencing their decision in prescribing statins in a lower middle-income country setting.
- Face-to-face interviews by an interviewer who was known to physicians made it possible to gain more trustworthy information.
- Follow-up interviews, member checking process, independent coders, discussion with several researchers to reach consensus and the use of a theoretical framework improved the credibility of the results.
- Despite code saturation was appropriately reached with a small sample size, a larger sample size is needed to obtain meaning saturation to provide a deeper understanding of the investigated phenomenon.

## INTRODUCTION

The use of statins has been endorsed by local and various international guidelines[1–6] to prevent cardiovascular (CV) disease (CVD)-related events or death in individuals without history of previous CVD (primary prevention) or with established CVD (secondary prevention).[7–9] But many studies demonstrate underprescribing, and in some cases overprescribing of this drug class. Underprescribing of statins is especially an issue in primary prevention, for example, in the groups with moderate-to-very high risk of CVD in the European general population and in an outpatient setting in the USA.[10–13] One small study (n=243 cases) with medical records data taken from three private hospitals in Jakarta, the capital city of the Republic of Indonesia, a lower middle-income country (LMIC), suggested patients might not be properly treated with statins. But underprescribing or overprescribing was not clearly defined, because data required to determine the appropriateness to prescribe statins are not routinely measured or well documented.[14 15] Another study in ambulatory patients with diabetes with established CVD in Surabaya revealed the phenomenon of underprescribing with 43% of eligible patients not receiving statins.[16] Studies investigating the consequences of underprescribing and overprescribing of statins are scarce. Nevertheless, one case study in a UK population with a ≥20% of 10-year risk of developing CVD, indicating the use of statins for primary prevention of

BMJ Open: first published as 10.1136/bmjopen-2019-035098 on 15 June 2020. Downloaded from http://bmjopen.bmj.com/ on March 5, 2025 at University of Surabaya . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

CVD, illustrates that underprescribing will substantially reduce quality-adjusted life years gained over a 9-year period (2006–2014) and overprescribing will certainly increase the cost burden of prescription between £80 million and £117 million annually without certainty whether the benefit of prevented CVD events outweighs the adverse drug reaction.[17]

Factors influencing physicians' prescribing behaviour, regardless of the medication being prescribed, have been investigated since 1950s. Physicians' personal and professional characteristics, pharmaceutical marketing strategies (direct-to-physician or direct-to-consumer marketing), drug information sources, drug characteristics, drug price and patients' characteristics have been identified as factors influencing physicians' prescribing behaviour, although there is inconsistency over the relative importance of each factor.[18–24] More importantly, the majority of studies in this field have been conducted in high-income Western countries with a different culture, healthcare and health insurance systems compared with LMICs.

In order to reach universal health coverage (UHC) in 2019, the Government of Indonesia launched a new mandatory National Health Insurance System (NHIS) programme (*Jaminan Kesehatan Nasional-Kartu Indonesia Sehat* (*JKN-KIS*)) run by the Indonesian Social Security Agency for Health (*Badan Pengelola Jaminan Sosial*, *BPJS Kesehatan*) in 2014.[25–27] The system facilitates more patients to go to the primary healthcare facilities first instead of directly visiting specialists in the secondary facilities.[25 28] Moreover, more medicines, listed in the 2014 revised edition of the National Formulary, are insured by the government to improve access to medications for patients.[25 29 30] Based on the National Formulary, two types of statins are insured (pravastatin and simvastatin). An estimation of the total CV risk score, which is necessary to guide statin prescribing for primary prevention of CVD, is not mentioned.[29 30] This policy is different compared with the new clinical guideline for patients with dyslipidaemia issued by the Indonesian Heart Association (IHA) which adapted guidelines issued by the European Society of Cardiology and the European Atherosclerosis Society.[2 31] In these guidelines, statins should be prescribed according to both the level of low-density lipoprotein cholesterol (LDL-c) and the total CV risk score, especially in patients with unknown or no history of CVD. Thus, this situation may create confusion for physicians in prescribing statins and increase the risk of underprescribing or overprescribing of statins. In the current qualitative study, we aimed to understand the key factors influencing physicians to prescribe statins, especially in the primary healthcare facilities in an LMIC.

## METHODS

### Study design and framework

This was a qualitative study using a phenomenological approach within a pragmatism interpretive framework. The pragmatism framework focuses on the phenomenon being investigated (key factors influencing physicians in prescribing statins) and the question inquired regarding this phenomenon. This framework allowed choosing the method that worked best in the field to answer the research question.[32] We used the Standards for Reporting Qualitative Research checklist when writing our report.[33]

### Study context and setting

As briefly introduced earlier, the Government of Indonesia set a new NHIS conducted by *BPJS Kesehatan*, namely *JKN-KIS*, in 2014. In this system, Indonesia's Ministry of Health also enforced the already existing platforms such as the National Formulary and the e-Catalogue to support cost-effective medicine and medical supply procurement throughout the country. The National Formulary lists medicines reimbursed by BPJS. The e-Catalogue is a national electronic platform required to be used by healthcare facilities for procuring medicines. The e-Catalogue lists medicines with their prices and selected pharmaceutical companies as supplier. Unless the medicines which are needed are not listed in the e-Catalogue, it is mandatory for all healthcare facilities to purchase medicines from this platform.[25 26]

Indonesia's primary healthcare is delivered by public and private primary healthcare facilities. Public primary healthcare facilities consist of primary health centres (PHCs or *puskesmas*) and their supporting networks (*pustu*, *puskel*, *polindes*, *poskesdes*) owned and organised by District or City Health Offices. Private primary healthcare facilities consist of individual practice general practitioners (GPs), midwives, and nurses; and private clinics. As a part of new NHIS program in 2014, the national referral system to access these facilities was also established. Figure 1 presents an overall picture of the healthcare delivery system in Indonesia.[34]

### Participants

We viewed the topic of our study was sensitive in nature.[35 36] Prescribing activity in Indonesia is an authority of registered physicians governed by regulations[37 38] and ethical codes.[39 40] There might be issues which would not be frankly expressed due to its sensitivity. Thus, we selected a city, a capital of a province in Indonesia, where our study had

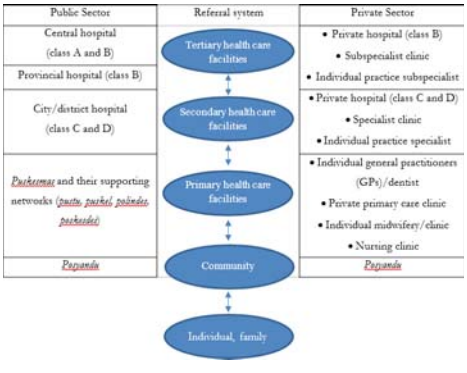



**Figure 1** Healthcare delivery system in Indonesia, figure was modified from Claramita *et al.*[34] *Puskesmas* is a public primary health centre. *Posyandu* is a service organised by volunteers (*Kader*) to deliver health programme for vulnerable groups, especially mother and children, locally. *Posyandu* is supervised by *Puskesmas*.[52]

BMJ Open: first published as 10.1136/bmjopen-2019-035098 on 15 June 2020. Downloaded from http://bmjopen.bmj.com/ on March 5, 2025 at University of Surabaya . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

been welcomed and approved by the local physician association of the city. We gathered information from physicians working at primary care health facilities in this city. The province was quite small with an area around 6000 ha. The city is the most populous city in the province with around 900 000 inhabitants in 2017, about 21.5% of the province's population. Indonesian regulation allows physicians to conduct their practice at a maximum of three healthcare facilities (public or private, primary or secondary level).[38] The views of the physicians included in our study reflect their practice to care for patients with and without CVD with possible indications for primary and secondary prevention of CVD.

We obtained the list of physicians' names registered as member of the physician association of the city, but up-to-date physicians' personal contact details were not available. Therefore, we purposively selected physicians who worked at the primary healthcare facilities in the capital city who were known to a member of the research team (SP) in a personal (friendship) or professional (acquaintance) manner, and consented to participate in the study. Participating physicians were then asked for contact details of potential other participants (snowball sampling).

### Data collection

Baseline characteristics of the participants were collected by interview (age, practice experience, educational period). Initially, an interview guide was developed by SI and SP based on general key factors in prescribing found in the literature (see box 1).[18] A semistructured face-to-face interview was conducted with each participant by SP between July 2015 and January 2016. To obtain the key factors considered by physicians in prescribing statins, SP only asked the main question at first. The probing questions were asked after physicians answered the first question in an explanatory way. All interviews were audio recorded using a tape recorder. The interviewer also took some field notes. The result from the initial interview of each participant was preanalysed directly by SI and SP to confirm whether it had covered the aim of the study and to determine if a follow-up interview with the same participant was needed. Data collection was discontinued when code saturation was reached as described by Hennink *et al*.[41]

**Box 1 Interview guide**

**Questions**

*Main question*

- Which factors do you consider when prescribing statins to the patient ?

*Probing question* (not necessarily being asked, depends on answers from the main question)

- Which therapeutic guideline did you usually use in prescribing statins ?
- How do you assess a total cardiovascular risk factor ?
- Which type of statins do you often prescribe ?
- Which statin dose and duration of use you prescribe ?
- How about the relation to pharmaceutical company promotion/advertising ?
- Does the regulation in the practice setting limit the decision of therapy ?
- Have you ever found patients complaining about the cost of statins ?
- Are you having difficulties in arranging time for a consultation with the patient because there are many queues ?
- Does an insurance system such as the new national health insurance programme limit you to prescribe statins to patients who need it ?

### Data analysis

The recorded interviews were listened to repeatedly and transcribed verbatim whenever possible. The field notes were checked to add information to the transcripts. To enhance trustworthiness and credibility of data analysis, a technique known as member checking was applied by returning each transcript to the respective participant to confirm the content of the interview.

Using the phenomenological approach, we highlighted and coded keywords which indicated key factors in prescribing statins from the transcripts. The same code was assigned to the same keyword. We categorised the codes in minor subthemes, subthemes and final major themes. The encoding process until obtaining subthemes was conducted independently by SP and RR. Disagreement regarding the codes and subthemes was discussed between SI and SP to reach a consensus. After subthemes were drawn, SP, SI and IWW discussed major themes and compared the themes with the findings from similar qualitative studies.

The final themes were refined by SI and KT and were mapped into a model that had previously been developed by Scoggins *et al*.[42] This was a qualitative study, investigating factors influencing GPs to prescribe statins in England using in-depth interviews and focus group discussions. Interviews were done with senior managers primary care service organisations (primary care trusts); focus group discussions were done with GPs of those organisations. The factors were classified into macrolevel, mesolevel and microlevel (figure 2).

### Patient and public involvement

There was no patient and public involvement in the design, conduct or reporting of our research.

## RESULTS

Ten physicians (nine females, one male) were willing to participate in this study. The mean age of all physicians was 31.7 years old (ranged 24–56). Five physicians graduated between 2010 and 2015, four between 2000 and 2010, and one between 1980 and 1990. The mean duration of medical education was 6.6 years (ranged 5–12 years). All physicians were GPs. One was in the process of becoming a specialist in internal medicine. All physicians were working at more than one healthcare facility, four of them practised at three different healthcare facilities including at the secondary level. On average, the physicians examined around 99 patients per week (range 30–250); the mean number of patients with CVD risk was 26.0 patients weekly (range 5–100).



BMJ Open: first published as 10.1136/bmjopen-2019-035098 on 15 June 2020. Downloaded from http://bmjopen.bmj.com/ on March 5, 2025 at University of Surabaya . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

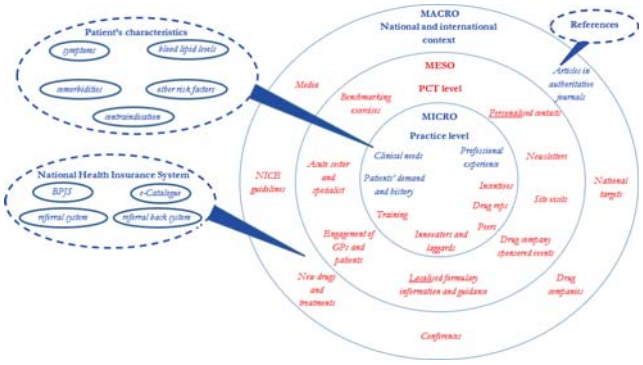



**Figure 2** Factors influencing general practitioners' (GPs) prescribing. Factors found from our study that matched to factors found by Scoggins *et al*[42] are presented in blue colour. BPJS, Badan Pengelola Jaminan Sosial; NICE, National Institute of Health and Clinical Excellence; PCT, primary care trust; reps, representatives.

Table 1 presents all major themes, subthemes and minor subthemes derived from transcript analysis. In general, there were two major themes drawn from the analysis: factors operating at (1) microlevel and (2) macrolevel. We did not identify any themes on the mesolevel. Figure 2 shows the themes mapped into the model by Scoggins *et al*.[42]

### Theme 1: key factors in statin prescribing at the microlevel

The physicians described the key factor influencing their decision to prescribe statins as their inherent understanding of the characteristics of patients which indicate the patient's need for a statin or a contraindication. There was some uncertainty around these characteristics which was inseparable from other factors like motivation and education. See for further explanation below.

#### Subtheme: patient's characteristics

Physicians described several patient's characteristics which they considered to be important for prescribing statins. The most important characteristic was a high level of total cholesterol (TC); other characteristics were clinical symptoms, comorbidities and other risk factors.

> From the level of cholesterol of the patient him/herself, if for example, it is more than 200 [mg/dL], for example 210, but it looks like it still can be [controlled] with dietary pattern, I have not prescribed it yet. However, if, for example, there have been symptoms such as [on the] neck and maybe he/she has high blood pressure, usually a medication [is prescribed]—simvastatin 1×10 mg. Actually, from my personal perspective, I do not look at the high blood pressure only. Only from the level of cholesterol, if, for example, it has been already high such as up to 250, 260, I give [the medication] even though the blood pressure is not high. (Physician 1)

Interestingly, there is disagreement over the cut-off of the TC level to initiate statins. Other disagreements were also found on how these factors related to each

**Table 1** Themes, subthemes and codings of factors influencing statin prescribing

| Major themes | Subthemes | Minor subthemes | Specific keywords |
|---|---|---|---|
| Microlevel | Patient's characteristics | Blood lipid levels | Total cholesterol (varied among participants: from 200 to 260 mg/dL), triglycerides, high LDL-c, low HDL-c, a combination of different lipid parameter |
| | | Symptoms | Pain (varied in location: back of the neck, neck, shoulder), stiffness (neck, shoulder), warmth (neck), tingling (palms, feet), dizziness |
| | | Comorbidities | Hypertension, diabetes, metabolic syndrome, heart disease |
| | | Contraindication | Pregnancy, liver disease |
| | | Other risk factors | Other risk factor without specifying the factor |
| | Professional experience | Primary and secondary prevention of CVD | Prevention, CVD prevention |
| Macrolevel | References | Standard | Standard |
| | | Guideline | Guideline from ACC/AHA |
| | | Journal | Article in journal |
| | National Health Insurance System | BPJS | BPJS |
| | | e-Catalogue | e-Catalogue |
| | | Referral system, referral back system | Patient referral |

ACC, American College of Cardiology; AHA, American Heart Association; BPJS, Badan Pengelola Jaminan Sosial; CVD, cardiovascular disease; HDL-c, high-density lipoprotein cholesterol; LDL-c, low-density lipoprotein cholesterol.

BMJ Open: first published as 10.1136/bmjopen-2019-035098 on 15 June 2020. Downloaded from http://bmjopen.bmj.com/ on March 5, 2025 at University of Surabaya . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

other when influencing the decision to prescribe statins. These variations of considerations were captured in the following quotes:

> It depends on the patient whether there is a comorbidity or not. If there is a comorbidity, usually [with the level of cholesterol] above 200, [statin] has already been prescribed. If not, maybe above 240. If there is hypertension, diabetes, above 200 also [it will] be directly given. (Physician 8)

> If, for example, the tryglycerides level is above 150, it can be prescribed. Then, after that… tryglycerides and total cholesterol. [For total cholesterol] usually above 200, it is prescribed. (Physician 10)

In prescribing statins, a physician also considered a situation where statin administration was contraindicated as quoted below:

> First, there has to be a clear or an appropriate indication. Then, whether there is a contraindication for the patient to use the medication for example in patients with liver disorder, then in patients who are pregnant—this is also a relative contraindication for statin administration. (Physician 6)

### Subtheme: professional experience of the prescribing physicians

This subtheme focused more on the personal choice of physicians. A mindset of CV event prevention motivated physicians to prescribe statins as described below:

> I give statins to the patient with high cholesterol lipid not just to decrease the level of the cholesterol. I mean that, you know that patient with high cholesterol lipid has much more risk for cardiovascular incident, because, in my knowledge, if the cholesterol level in the blood is so high, [it] can cause the plaque in the vascular, in the blood vessels. If the plaque becomes unstable, [it] can cause a rupture and make a mismatched perfusion and demand. So, I give the statin for the cholesterolemias, uh… the high cholesterol level in the laboratory test, other reason—no other reason, I think. It's the main reason. It's my first reason to give [is] to prevent. It prevents the cardio, the risk of cardiovascular incident. (Physician 4)

> … for statin administration as a medication to manage dyslipidemia, especially in patients with dyslipidemia or in patients with high risk of cardiovascular disease events that it can be as preventive therapy in cardiovascular disease, such as in patients who have already had a coronary heart disease or in patients with diabetes mellitus and… and with a risk, with peripheral artery disease so to say, hence there is a place to give [statin] or in patients with stroke. (Physician 6)

## Theme 2: key factors in statin prescribing operating at the macrolevel

We found that international information or references framed the physician's mindset of patients who were candidates to receive statins. Furthermore, the NHIS supported or hindered the decision to prescribe statins.

### Subtheme: references

References including journals and guidelines were information sources which may frame physicians' knowledge on which patients to prescribe statins for. These factors were not mentioned initially by participants but elicited through probing questions. The sources mentioned included therapeutic guidelines covered during medical education as well as local and global standards.

> I do… as in the standard operating procedure, that is, giving a healthy lifestyle first… a healthy dietary lifestyle. The standard operating procedure is from sources for example from journals… yes…also with medical references in the past… got from the college and when I was in the hospital [during internship as a junior physician] (Physician 2)

> In the past Framingham score was used to determine the risk for cardiovascular events. Now there is a new published guideline where [the risk] was not calculated from the Framingham score but [also] saw other risk factors. If not mistaken, [the guideline] was issued by American Heart Association also. (Physician 6)

> There is a standard for that. If, for example, [the level of cholesterol] is above 250, the medication is just started. If it is between 200–250, counseling related to dietary pattern and lifestyle only. (Physician 9)

### Subtheme: NHIS

Although the new NHIS means more patients get free access to medicines, there are still criteria to prescribe statins for reimbursement in the National Formulary which may or may not facilitate prescribing. For example, in the National Formulary, it was stated that pravastatin was to be given only to patients with hyperlipidaemia who had LDL-c level >160 mg/dL, to patients with coronary heart disease, and patients with diabetes and macroalbuminuria.[29 30] This suggested that physicians would tend to prescribe to this type of patients or would prescribe it anyway if the patient did not meet this strict criteria but was considered to need a statin with the consequence it would not be reimbursed by BPJS.

> The price is cheap, [it] is easy to obtain… in terms of it is available everywhere, then also available in generic. This also does not make it difficult for some patients even more when retired elderly patients do not have money but using *BPJS*. So, I think that is my consideration. (Physician 5)

> BPJS will only reimburse the administration of statins for LDL above 160. Therefore, if it is under 160, patients usually buy it by themselves, so we prescribe. Meanwhile, specialists in hospitals usually prescribe but this is not reimbursed by BPJS… so we help by prescribe it again. (Physician 8)



BMJ Open: first published as 10.1136/bmjopen-2019-035098 on 15 June 2020. Downloaded from http://bmjopen.bmj.com/ on March 5, 2025 at University of Surabaya . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

> No, if indeed only the cholesterol is high, I think no need to refer [the patient]. No diabetes, nothing… we usually prescribe directly, unless when simvastatin is incidentally not available in *Puskesmas*… he/she [the patient] insists because he/she has a right… sometimes the medication is not available. He/she has the right… insurance right, for example he/she wants a referral, we refer. However, there he/she also does not certainly obtain [a statin] if the LDL is under 160. (Physician 8)

### A theme categorised under Pandora box

We attempted to elicit the impact of pharmaceutical companies and their marketing strategy related to statin prescribing, but physicians preferred to not discuss this topic with the researcher.

## DISCUSSION

Physicians' decision to prescribe statins was influenced by factors operating at the microlevel and macrolevel which mapped well on the framework developed by Scoggins *et al* (2006) in a study on the factors influencing GPs prescribing of statins in primary care in England. The key microlevel factor was a set of patient's characteristics, especially the high level of TC. At the macrolevel, physicians explained that their knowledge on prescribing was grounded in their education at university as well as reading guidelines or other reference sources such as medical journals. Another macrolevel factor was the new NHIS which facilitated or limited the prescribing of statins.

The strength of this study lies in the use of a qualitative method to explore processes behind the behaviour of prescribing statins in Indonesia, an LMIC in transition to achieve UHC. The validity of the data was improved by follow-up interviews, member checking process, independent coders and discussion with several researchers to reach consensus. Although we have reached code saturation with our interviews, we only interviewed a relatively small number of physicians having relatively homogenous characteristics from one city in one province in Indonesia. Furthermore, the interviewer knew a number of the physicians personally and this may have had an impact on the willingness to share sensitive information. The interviewer had the subjective impression that those interviews were longer and contained more information than the interviews with the physicians which she met the first time. Owton and Allen-Collinson discussed the use of friendship approach for data collection in ethnographic research. Although they noted interactional challenges during interviews, for example, emotional overload and power struggle, due to a role conflict being a friend and a researcher, but overall, this approach revealed more personal and sensitive information in some encounters.[43] Nevertheless, several of our findings are comparable with other qualitative studies. Therefore, although the current study is explorative, our findings are the foundation for a future quantitative study, for example, surveys and interventions, in Indonesia. More qualitative work on eliciting factors influencing physician's prescribing behaviour in other Asian regions and other therapeutic areas could complement our findings.

Similar to Scoggins *et al* (2006), our study found the clinical need of patients as an important factor to consider prescribing statins. However, physicians in our study described the clinical needs in more detail, mainly the level of TC and other risk factors potentially increasing the risk of CVD. Of note, the physicians did not specifically differentiate between statin prescribed for primary or secondary prevention of CVD. Interestingly, the range of cholesterol levels to start statins ranged from 200 mg/dL to 260 mg/dL and there was also a variation in taking other CVD risk factors into account. For example, one physician decided to give a statin when the TC level ≥210 mg/dL and the patient also had clinical symptoms and comorbidities while another physician only prescribed statins when the patient's TC level was ≥260 mg/dL without the presence of comorbidities. This practice was not in line with the local guideline to initiate statin therapy.[2] The patient's total CV risk calculation was only acknowledged once after probing. This variation may lead to underprescribing or overprescribing of statins. The hesitation and inconsistency in using risk assessment tools as a guidance to initiate statin therapy have also been revealed in another qualitative study performed among GPs in the UK which showed that GPs found it difficult to interpret the tool for Asian patients and therefore preferred to assess the risk intuitively.[44] The physicians in our study had some general background knowledge on statin prescribing which was by and large in line with the National Formulary. They did not mention the use of the national guideline issued by the IHA as sources to guide statin prescribing. This raises the question whether this guideline is sufficiently promoted.

Our general findings are also in agreement with a report from WHO on the drug use situation in Indonesia in 2011. It reported non-uniform sources of drug information used by physicians; they could be old text books from medical school or the internet with little use of up-to-date sources of independent drug information. The national standard treatment guideline for PHCs was not used much by physicians.[45] Even if it was used, there was no recommendation to use statins in patients with coronary heart disease as the guideline was developed when statins had not routinely been used in clinical practice.[46]

We could not disclose the role of medical representatives or pharmaceutical companies as shown in other studies[24 42] in influencing statin prescribing. Most likely the interviewees perceived this topic as too controversial within both the medical profession and broader community to be willing to discuss it.[47] Nevertheless, the WHO report suggested medical representatives from pharmaceutical companies as one of probable sources of drug information used by most physicians.[45] As the WHO report is based on a situational analysis conducted in 2011 where the NHIS was still not integrated, it is not possible to know to what extent the role of pharmaceutical companies has changed. As this question clearly created an ethical dilemma, therefore, a

BMJ Open: first published as 10.1136/bmjopen-2019-035098 on 15 June 2020. Downloaded from http://bmjopen.bmj.com/ on March 5, 2025 at University of Surabaya . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

collaboration with the Ministry of Health and professional bodies and councils is needed to provide a less biased answer.

Patients' demand or request for medicines is a factor influencing physicians' prescribing behaviour according to Scoggins *et al* (2006). This factor was not mentioned in our interviews although there was an indication that patient's insistence may influence the physician to meet the patient's expectation, for example, in granting a referral. The lack of involvement of the patients' voice in the physicians' decision can be caused by differences in physician–patient communication style which may be rooted in cultural differences between Southeast Asians and Westerners.[48 49] The majority of studies exploring factors influencing physicians' prescribing behaviour come from Western countries where the physician–patient communication style is often based on a partnership style with the concept of equity.[20 24 42 44 50 51] Southeast Asian physicians commonly tend to communicate in a paternalistic or one-way style, which gives the physician a more dominant role towards the patient. The culture of Southeast Asian physicians in keeping a social distance supports this communication style.[48 49]

We found that the NHIS had a considerable influence on physicians' prescribing decisions, in particular on the choice of generics. This is in line with the concept from Scoggins *et al* (2006) that prescribing decisions are influenced by factors operating at national context or macrolevel. However, Scoggins *et al* (2006) only list national and international evidence based on authoritative journals, national guidelines, national media and the development of new treatments as factors. This difference may be explained because of differences in organising healthcare and reimbursement of medication between Indonesian and England.

In contrast to Scoggins *et al*,[42] we did not identify any factors at the mesolevel such as benchmarking between different primary care practices, collaborations between primary care and specialists and regional formularies. This is understandable as strengthening the primary care sector is a recently developed strategy with the new NHIS in Indonesia. Therefore, activities which are common practice in the English primary care system at the mesolevel have not been established in Indonesia yet. This finding is an opportunity for the government to work on the mesolevel to strengthen rational prescribing behaviour.

The findings from our study indicate that physicians have a lack of awareness of specific guideline recommendations, especially on the use of LDL-c level and total CV risk calculation as decisive factors to prescribe statins. Improved access to statins facilitated by the government through the new NHIS seemed to be a good first step in fostering rational prescribing. A next step would be to include the recommendations from clinical guidelines issued by IHA into this system, especially through the National Formulary.

**Author affiliations**
[1]PharmacoTherapy, -Epidemiology & -Economics, University of Groningen, Groningen, The Netherlands
[2]Centre for Medicines Information and Pharmaceutical Care, Faculty of Pharmacy, Universitas Surabaya, Surabaya, Indonesia
[3]Department of Clinical and Community Pharmacy, Faculty of Pharmacy, Universitas Surabaya, Surabaya, Indonesia
[4]Faculty of Pharmacy, Universitas Surabaya, Surabaya, Indonesia
[5]Optima Pharmacy, Surabaya, Indonesia
[6]Department of Cardiovascular Medicine, Udayana University, Denpasar, Bali, Indonesia
[7]Department of Clinical Pharmacy & Pharmacology, University Medical Center Groningen, Groningen, Indonesia

**Acknowledgements** The authors would like to thank to all physicians participated in this study.

**Contributors** SI, SP and IWW conceived and designed the study. SP carried out the interviews. SI, SP, RR, EH and KT analysed and interpreted the data. SI and SP drafted the manuscript. IWW, BW, EH and KT gave critical inputs to the intellectual content in the drafted manuscript. All authors read, revised and approved the final manuscript. SP had full access to all of the data in the study. All authors can take responsibility for the integrity of the work.

**Funding** SI received support from the Indonesia Endowment Fund for Education (Lembaga Pengelola Dana Pendidikan), the Ministry of Finance of Republic of Indonesia, in the form of scholarship for her PhD program.

**Competing interests** None declared.

**Patient and public involvement statement** There was no patient and public involvement in the design, conduct, or reporting of our research.

**Patient consent for publication** Not required.

**Ethics approval** This study was approved by the local Indonesian Medical Association. The aim of the study was known to all participants before the interview was started. A written informed consent was obtained from each participants. Participant's personal identities were kept anonymous and all transcripts were stored and maintained confidential.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data from the interviews that correspond to the results of this study, after de-identification of study participants, can be made available upon request at the beginning 9 months and ending 36 months following manuscript publication for researchers who provide a methodologically sound proposal. Proposal should be directed to the corresponding author of this study ( sylviirawati.2010@gmail.com).

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution 4.0 Unported (CC BY 4.0) license, which permits others to copy, redistribute, remix, transform and build upon this work for any purpose, provided the original work is properly cited, a link to the licence is given, and indication of whether changes were made. See: https://creativecommons.org/licenses/by/4.0/.

**ORCID iD**
Sylvi Irawati http://orcid.org/0000-0001-6278-9017

## REFERENCES

1 World Health Organization. *Prevention of cardiovascular disease: guidelines for assessment and management of cardiovascular risk*. Geneva: WHO Press, 2007.
2 Erwinanto SA, Putranto JNE, *et al*. Pedoman tatalaksana dislipidemia. *J Kardiol Indones* 2013;34:245–70.
3 JBS3 Board. Joint British Societies' consensus recommendations for the prevention of cardiovascular disease (JBS3). *Heart* 2014;100:ii1–67.
4 Piepoli MF, Hoes AW, Agewall S, *et al*. 2016 European guidelines on cardiovascular disease prevention in clinical practice: the sixth Joint task force of the European society of cardiology and other societies on cardiovascular disease prevention in clinical practice (constituted by representatives of 10 societies and by invited experts) developed with the special contribution of the European association



BMJ Open: first published as 10.1136/bmjopen-2019-035098 on 15 June 2020. Downloaded from http://bmjopen.bmj.com/ on March 5, 2025 at University of Surabaya . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

for cardiovascular prevention & rehabilitation (EACPR). *Eur Heart J* 2016;37:2315–81.
5 Stone NJ, Robinson JG, Lichtenstein AH, *et al*. 2013 ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults: a report of the American College of Cardiology/American heart association task force on practice guidelines. *J Am Coll Cardiol* 2014;63:2889–934.
6 Catapano AL, Graham I, De Backer G, *et al*. 2016 ESC/EAS guidelines for the management of dyslipidaemias. *Eur Heart J* 2016;37:2999–3058.
7 Chou R, Dana T, Blazina I, *et al*. Statins for prevention of cardiovascular disease in adults: evidence report and systematic review for the US preventive services task force. *JAMA* 2016;316:2008–24.
8 Cholesterol Treatment Trialists' (CTT) Collaborators, Mihaylova B, Emberson J, *et al*. The effects of lowering LDL cholesterol with statin therapy in people at low risk of vascular disease: meta-analysis of individual data from 27 randomised trials. *Lancet* 2012;380:581–90.
9 Taylor F, Huffman MD, Macedo AF, *et al*. Statins for the primary prevention of cardiovascular disease. *Cochrane Database Syst Rev* 2013:CD004816.
10 Tonstad S, Rosvold EO, Furu K, *et al*. Undertreatment and overtreatment with statins: the Oslo health study 2000-2001. *J Intern Med* 2004;255:494–502.
11 Smith MA, Cox ED, Bartell JM. Overprescribing of lipid lowering agents. *Qual Saf Health Care* 2006;15:251–7.
12 Verma A, Visintainer P, Elarabi M, *et al*. Overtreatment and undertreatment of hyperlipidemia in the outpatient setting. *South Med J* 2012;105:329–33.
13 Langsted A, Freiberg JJ, Nordestgaard BG. Extent of undertreatment and overtreatment with cholesterol-lowering therapy according to European guidelines in 92,348 Danes without ischemic cardiovascular disease and diabetes in 2004-2014. *Atherosclerosis* 2017;257:9–15.
14 Simatupang A, Irianto A, Simanjuntak W, *et al*. Pattern of statin use in several hospital in Jakarta: a cross sectional study. *J Kedokt Yars* 2006;14:223–9.
15 Third report of the National cholesterol education program (NCEP). expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (adult treatment panel III) final report. *Circulation* 2002;106:3143–421.
16 Lie PGCE, Irawati S, Presley B, *et al*. Prevention of cardiovascular disease in diabetes mellitus outpatient: focusing on antiplatelet, statins and irrational antihypertensive drug use. *Indones J Clin Pharm* 2016;5:169–83.
17 Hodgson R, Biswas M, Morgan P. Costs and consequences of lack of adherence to prescribing guidelines for statins in the UK: a value of implementation analysis (PCV41). *Value Heal* 2017;20:A266.
18 Groves KE, MacKinnon NJ, Sketris I. Prescribing behavior. In: Mickey C, ed. *Social and behavioral aspects of pharmaceutical care*. 2 edn. Sudburry, USA: Jones and Bartlett Publishers, 2010: 141–76.
19 Hemminki E. Factors influencing drug prescribing: inquiry into research strategy. *Drug Intell Clin Pharm* 1976;10:321–9.
20 Hemminki E. Review of literature on the factors affecting drug prescribing. *Soc Sci Med* 1975;9:111–5.
21 Theodorou M, Tsiantou V, Pavlakis A, *et al*. Factors influencing prescribing behaviour of physicians in Greece and Cyprus: results from a questionnaire based survey. *BMC Health Serv Res* 2009;9:150.
22 Christensen DB, Bush PJ. Drug prescribing: patterns, problems and proposals. *Soc Sci Med* 1981;15:343–55.
23 Schumock GT, Walton SM, Park HY, *et al*. Factors that influence prescribing decisions. *Ann Pharmacother* 2004;38:557–62.
24 Murshid MA, Mohaidin Z. Models and theories of prescribing decisions: a review and suggested a new model. *Pharm Pract (Granada)* 2017;15:1–12.
25 Agustina R, Dartanto T, Sitompul R, *et al*. Universal health coverage in Indonesia: concept, progress, and challenges. *Lancet* 2019;393:75–102.
26 Wasir R, Irawati S, Makady A, *et al*. Use of medicine pricing and reimbursement policies for universal health coverage in Indonesia. *PLoS One* 2019;14:e0212328–19.
27 Wirtz T. *The new mandatory health insurance scheme: taking stock one year after the introduction*. PT Ernst & Young Indonesia, 2015.
28 Ekawati FM, Claramita M, Hort K, *et al*. Patients' experience of using primary care services in the context of Indonesian universal health coverage reforms. *Asia Pac Fam Med* 2017;16:1–10.
29 Kementerian Kesehatan Republik Indonesia. *Keputusan Menteri Kesehatan Republik Indonesia tentang Formularium Nasional. No. 328/MENKES/SK/VIII/2013*, 2013.
30 Kementerian Kesehatan Republik Indonesia. *Keputusan Menteri Kesehatan Republik Indonesia tentang perubahan atas Keputusan Menteri Kesehatan No. 328/MENKES/SK/IX/2013 tentang Formularium Nasional. No. 159/MENKES/SK/V/2014*, 2014.
31 European Association for Cardiovascular Prevention & Rehabilitation, Reiner Z, Catapano AL, *et al*. ESC/EAS guidelines for the management of dyslipidaemias: the task force for the management of dyslipidaemias of the European Society of cardiology (ESC) and the European atherosclerosis Society (EAS). *Eur Heart J* 2011;32:1769–818.
32 Creswell J, Poth CN. *Qualitative inquiry and research design: choosing among five approaches*. 4 edn. Los Angeles: SAGE Publication, Inc, 2018.
33 O'Brien BC, Harris IB, Beckman TJ, *et al*. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med* 2014;89:1245–51.
34 Claramita M, Syah NA, Ekawati FM, *et al*. *Primary health care systems (Primasys): case study from Indonesia, abridged version*. Geneva: World Health Organization, 2017.
35 Budianto A. Peresepan dokter: organized crime? *JHP* 2009;39:511–30.
36 Muh Fadhli W, Anisah S. Legal responsibilities of doctors and pharmacists in the services of recipes. *Media Farm* 2016;13:61–87.
37 Presiden Republik Indonesia. *Undang-Undang Republik Indonesia tentang Praktik Kedokteran*, 2004.
38 Kementerian Kesehatan Republik Indonesia. *Peraturan Menteri Kesehatan Republik Indonesia tentang Izin Praktik DAN Pelaksanaan Praktik Kedokteran. No. 2052/MENKES/PER/X/2011*, 2011.
39 Purwadianto A, Soetedjo GS, *et al*. *Kode etik kedokteran Indonesia*. Jakarta: Pengurus Besar Ikatan Dokter Indonesia, 2012.
40 Badan Etik dan Pembelaan Anggota Pengurus Pusat PERKI. *Pedoman kode etik dokter Perhimpunan Kardiologi Indonesia (PERKI)*. 1 edn. Jakarta: PERKI, 2014.
41 Hennink MM, Kaiser BN, Marconi VC. Code saturation versus meaning saturation: how many interviews are enough? *Qual Health Res* 2017;27:591–608.
42 Scoggins A, Tiessen J, Ling T. Prescribing in primary care: understanding what shapes GPs' prescribing choices and how might these be changed, 2006. Available: https://www.rand.org/content/dam/rand/pubs/technical_reports/2007/RAND_TR443.pdf [Accessed 25 Feb 2015].
43 Owton H, Allen-Collinson J. Close but not too close: friendship as method(ology) in ethnographic research encounters. *J Contemp Ethnogr* 2014;43:283–305.
44 Kedward J, Dakin L. A qualitative study of barriers to the use of statins and the implementation of coronary heart disease prevention in primary care. *Br J Gen Pract* 2003;53:684–9.
45 Holloway K. Pharmaceuticals in health care delivery, 2011. Available: http://searo.who.int/entity/medicines/indonesia_situational_analysis.pdf?ua=1
46 Departemen Kesehatan RI. *Pedoman pengobatan dasar di Puskesmas*. Jakarta: Departemen Kesehatan RI, 2007.
47 Komesaroff PA, Kerridge IH. Ethical issues concerning the relationships between medical practitioners and the pharmaceutical industry. *Med J Aust* 2002;176:118–21.
48 Claramita M, Van Der Vleuten CP, Van Dalen J. Doctors in a Southeast Asian country communicate sub-optimally regardless of patients' educational background. *Patient Educ Couns* 2011;85:e169–74.
49 Claramita M, Nugraheni MDF, van Dalen J, *et al*. Doctor-patient communication in Southeast Asia: a different culture? *Adv Health Sci Educ Theory Pract* 2013;18:15–31.
50 Grant A, Sullivan F, Dowell J. An ethnographic exploration of influences on prescribing in general practice: why is there variation in prescribing practices? *Implement Sci* 2013;8:2013.
51 AB E, Denig P, van Vliet T, *et al*. Reasons of general practitioners for not prescribing lipid-lowering medication to patients with diabetes: a qualitative study. *BMC Fam Pract* 2009;10:24.
52 Andriani H, Liao CY, Kuo HW. Association of maternal and child health center (Posyandu) availability with child weight status in Indonesia: a national study. *Int J Environ Res Public Health* 2016;13:293.

BMJ Open: first published as 10.1136/bmjopen-2019-035098 on 15 June 2020. Downloaded from http://bmjopen.bmj.com/ on March 5, 2025 at University of Surabaya . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

BMJ Journals

search Search Advanced search

Latest content Archive For authors About Browse by collection

Email alerts

BMJ Open is an online, open access journal, dedicated to publishing medical research from all disciplines and therapeutic areas.

**Impact Factor:** 2.4

**Citescore:** 4.4

All metrics >>

The journal publishes all research study types, from protocols through phase I trials to meta-analyses, including small, specialist studies, and negative studies. Publishing procedures are built around fully open peer review and continuous publication, publishing research online as soon as the article is ready.

*BMJ Open* aims to promote transparency in the publication process by publishing reviewer reports and previous versions of manuscripts as pre-publication histories. Authors are asked to pay article-publishing charges on acceptance; the ability to pay does not influence editorial decisions.

All papers are included in MEDLINE/PubMed and Science Citation Index Expanded (Web of Science).

## Authors

BMJ Open accepts submissions on a range of article types, including original research, cohort profiles and protocols.

The Author Information section provides specific article requirements to help you turn your research into an article suitable for BMJ Open.

Information is also provided on editorial policies and open access.

Author information

Submit a paper

# Editorial Board

*BMJ Open* Editorial Board members have agreed and adhere to the BMJ Editor Roles and Responsibilities guidelines; including our Editor policy on competing interests.

## Editor in Chief

**Adrian Aldcroft**
BMJ
London, UK
orcid.org/0000-0003-0106-720X
**Declaration of Interests:** Nothing to Declare

## Deputy Editor

**Clare Partridge**
BMJ
London, UK
orcid.org/0000-0001-8241-0553
Competing interests>>

## Executive Editors

**Natasha Leeson**
BMJ
London, UK
orcid.org/0000-0002-9832-2387
Competing interests>>

**Edward Sucksmith**
BMJ
London, UK
orcid.org/0000-0003-1419-9359
Competing interests>>

**Shona Reeves**
BMJ
London, UK
orcid.org/0000-0001-6585-8313
Competing interests>>

## Research Editors

**Ria Anjo**
BMJ
London, UK
orcid.org/0009-0004-6393-1512
Competing interests>>

**Nicole Martin**
BMJ
London, UK
orcid.org/0000-0001-9186-1313
Competing interests>>

**Artur Arikainen**
BMJ
London, UK

**Thomas Phillips**
BMJ
London, UK

orcid.org/0000-0001-7836-1197
Competing interests>>

orcid.org/0000-0002-4709-2550
Competing interests>>

**Neil Bennet**
BMJ
London, UK
orcid.org/0000-0002-9342-443X
Competing interests>>

**Jamie Royle**
BMJ
London, UK
orcid.org/0000-0002-5227-4105
Competing interests>>

**Amy Branch-Hollis**
BMJ
London, UK
orcid.org/0000-0002-9750-8008
Competing interests>>

**Florence Theil**
BMJ
London, UK
orcid.org/0000-0002-4144-9002
Competing interests>>

**Shauna Heffernan**
BMJ
London, UK
orcid.org/0000-0001-8173-9381
Competing interests>>

**Sinéad Weldon**
BMJ
London, UK
orcid.org/0000-0001-5628-6624
Competing interests>>

**Anne Menard**
BMJ
London, UK
orcid.org/0000-0001-6722-8673
Competing interests>>

**Zainab Yusuf**
BMJ
London, UK
orcid.org/0000-0001-7859-5102
Competing interests>>

## Editorial Coordinator

**Becky Kitchin**
BMJ
London, UK

## Editorial Assistant

**Laura Phillips**
BMJ
London, UK

## Associate Editors

**Nicole Martin**
BMJ
London, UK

**Emma Johnson**
BMJ
London, UK

**Shivali Fulchand**
BMJ
London, UK

**Ana Lopez**
BMJ
London, UK

**Helen Howard**
BMJ
London, UK

**Helen Surana**
BMJ
London, UK

**Emma Veitch**
BMJ
London, UK

**Jennifer Thorley**
BMJ
London, UK

**Eleni Panagoulas**
BMJ
London, UK

**Christine Ferguson**
BMJ
London, UK

## Statistical Reviewers


**Lucinda Archer**
University of Birmingham
Birmingham, United Kingdom

**Kyle Dack**
University of Bristol
Bristol, UK

**Zoe Kelson**
University of Exeter
Exeter, UK

**Tobias Kurth**
Charité – Universitätsmedizin Berlin
Berlin, Germany

**James Martin**
University of Birmingham
Birmingham, United Kingdom

**Mohammed Moinuddin**
University of Central Lancashire
Lancashire, UK

**Bright Offorha**
University of Sheffield
Sheffield, UK

**Katie Scandrett**
University of Birmingham
Birmingham, United Kingdom


## Editorial Advisory Board


**Abdullah Aljoudi**
University of Dammam
Al Khobar, Saudi Arabia

**Fredrick Ashbury**
PwC
Toronto, Canada

**Greg Atkinson**
Teesside University
Teesside, UK

**Adrian Barnett**
Queensland University of Technology
Queensland, Australia

**Anne Barton**
University of Manchester
Manchester, UK

**Christina Bergh**
Sahlgrenska University Hospital
Gothenburg, Sweden

**Jeffrey Braithwaite**
Macquarie University
Sydney, Australia

**Meredith Brooks**
Boston University
Boston, USA

**Chris Bullen**
University of Auckland
Auckland, New Zealand

**Alexandra Burton**
Queen Mary University of London
London, UK

**Angela Lupattelli**
University of Oslo
Oslo, Norway

**C Raina MacIntyre**
University of New South Wales
Sydney, Australia

**Parker Magin**
The University of Newcastle
Callaghan, Australia

**Arch G. Mainous III**
University of Florida
Florida, USA

**Tanja Manser**
University of Applied Sciences and Arts
Northwestern Switzerland
Olten, Switzerland

**Shabir Moosa**
University of the Witwatersrand
Johannesburg, South Africa

**Irwin Nazareth**
University College London
London, UK

**Anna Odone**
University of Pavia
Pavia, Italy

**Ian Pavord**
University Hospitals of Leicester NHS Trust
Leicester, UK

**Arjee Javellana Restar**
Johns Hopkins University

**Andrew Bush**
Imperial College London
London, UK

**Christopher Butler**
University of Cardiff
Cardiff, UK

**Breda Eubank**
Mount Royal University
Calgary, Canada

**Tom Fahey**
Royal College of Surgeons in Ireland
Dublin, Ireland

**David Felson**
Boston University
Boston, USA

**Rosario Ferrer Cascales**
University of Alicante
Alicante, Spain

**Tsion Firew**
Columbia University
New York, USA

**Joel Francis**
University of the Witwatersrand
Johannesburg, South Africa

**Jenny Godley**
The University of Calgary
Alberta, Canada

**Nicholas Graves**
Queensland University of Technology
Brisbane, Australia

**Lucy Griffiths**
Swansea University,
Swansea, UK

**Gordon Guyatt**
McMaster University
Hamilton, Canada

**Caroline Homer**
University of Technology Sydney
Sydney, Australia

**Lei Huang**
Anhui Medical University
Hefei, China

Baltimore, USA

**Paula Rochon**
Women's College Hospital
Toronto, Canada

**David Silvério Rodrigues**
NOVA Medical School
Lisbon, Portugal

**Jane Sandall**
King's College London
London, UK

**Lesley Stewart**
University of York
York, UK

**Stephanie Stock**
University Clinic of Cologne
Cologne, Germany

**Martin Stockler**
University of Sydney
Sydney, Australia

**Lehana Thabane**
McMaster University
Hamilton, Canada

**Matthew Thompson**
University of Washington
Seattle, USA

**Allison Tong**
University of Sydney
Sydney, Australia

**Chukwuma Umeokonkwo**
Federal Teaching Hospital
Abakaliki, Nigeria

**Veronique Verhoeven**
University of Antwerp
Antwerp, Belgium

**Andrew Vickers**
Memorial Sloan-Kettering Cancer Centre
New York, USA

**Cecilia Vindrola**
University College London
London, UK

**Jo Waller**
Queen Mary University

**Luis Huicho**
Cayetano Heredia University
Lima, Peru

**Andre Pascal Kengne**
South African Medical Research Council
Cape Town, South Africa

**Rose Anne Kenny**
Trinity College Dublin
Dublin, Ireland

**Emma Kirby**
University of New South Wales,
Sydney, Australia

**Sallie Lamb**
University of Oxford
Oxford, UK

**Liliana Laranjo**
Macquarie University
Sydney, Australia

**Heidi Lempp**
King's College London
London, UK

**Joel Lexchin**
York University
Toronto, Canada

**Helena Liira**
University of Helsinki
Helsinki, Finland

**Fiona M. Walter**
University of Cambridge
Cambridge, UK

**Yize Wan**
Queen Mary University of London
London, UK

**Hywel Williams**
University of Nottingham
Nottingham, UK

**Janet Wilson**
Newcastle University
Newcastle, UK

**Charles S. Wiysonge**
South African Medical Research Council
Cape Town, South Africa

**Yangfeng Wu**
The George Institute
Beijing, China

## Statistical Advisory Board

**Victoria Allgar**
University of York
York, UK

**Peter Baade**
Cancer Council Queensland
Queensland, Australia

**Adrian Barnett**
Queensland University of Technology
Queensland, Australia

**Alan Batterham**
Teesside University
Middlesbrough, UK

**Robin Christensen**
Copenhagen University Hospital
Copenhagen, Denmark

**Yannan Jiang**
University of Auckland
Auckland, New Zealand

**Le Kang**
US Food and Drug Administration
Maryland, USA

**Bernet Kato**
Imperial College London
London, UK

**Jake Olivier**
University of New South Wales
Sydney, Australia

**Timothy Pickles**
Cardiff University,
Cardiff, UK

**Stephen-Mark Cooper**
Cardiff Metropolitan University
Cardiff, UK

**Helen Dakin**
University of Oxford
Oxford, UK

**David Gillespie**
Cardiff University
Cardiff, UK

**Andrew Hinde**
University of Southampton
Southampton, UK

**Avinesh Pillai**
University of Auckland
Auckland, New Zealand

**Katie Saunders**
University of Cambridge
Cambridge, UK

**Yana Vinogradova**
University of Nottingham
Nottingham, UK

**Peter Watson**
University of Cambridge
Cambridge, UK

Editorial advisory board members provide feedback on the journal's performance, advise on priorities and developments within their areas of expertise/ interest and may be consulted on individual manuscripts for an editorial opinion or to suggest reviewers. They do not take editorial decisions.

## Publishing Team

**Associate Publisher:** Geetha Balasubramaniam

**Publisher:** Theodora Bloom



Online ISSN: 2044-6055

Copyright © 2025 BMJ Publishing Group Ltd. All rights reserved.

Viewing from: University of Surabaya



# Table of contents

## June 2020 - Volume 10 - 6

Prev issue Next issue

Original research: Sarcopenia, physical frailty, undernutrition and obesity cooccurrence among Portuguese community-dwelling older adults: results from Nutrition UP 65 cross-sectional study (15 June, 2020)
Ana Rita Sousa-Santos, Cláudia Afonso, Nuno Borges, Alejandro Santos, Patrícia Padrão, Pedro Moreira, Teresa F Amaral

Protocol: Protocol for a realist review of General Practitioners' Role in Advancing Practice in Care Homes (GRAPE study) (15 June, 2020)
Adam L Gordon, Reena Devi, Christopher Williams, Claire Goodman, Kathleen Sartain, Neil H Chadborn

Original research: Efficacy of prehospital National Early Warning Score to predict outpatient disposition at an emergency department of a Japanese tertiary hospital: a retrospective study (15 June, 2020)
Takuro Endo, Toru Yoshida, Tomohiro Shinozaki, Takako Motohashi, Hsiang-Chin Hsu, Shunsuke Fukuda, Jumpei Tsukuda, Takaki Naito, Kenichiro Morisawa, Nobuhiko Shimozawa, Yasuhiko Taira, Shigeki Fujitani

Original research: Association between faecal haemoglobin concentration and the risk of cardiovascular diseases among Taiwanese adults in a community-based screening cohort (15 June, 2020)
Kuo-Liong Chien, Ting-Yu Lin, Chen-Yang Hsu, Chang-Chuan Chan, Tony Hsiu-Hsi Chen, Li-Sheng Chen

Original research: Cost–utility analysis of antibiotic treatment in patients with chronic low back pain and Modic changes: results from a randomised, placebo-controlled trial in Norway (the AIM study) (15 June, 2020)
Margreth Grotle, Lars Christian Bråten, Jens Ivar Brox, Ansgar Espeland, Zinajda Zolic-Karlsson, Rikke Munk Killingmo, Alexander Tingulstad, Lars Grøvle, Anne Froholdt, Per Martin Kristoffersen, Monica Wigemyr, Maurits W van Tulder, Kjersti Storheim, John-Anker Zwart

Original research: Has the UK living kidney donor population changed over time? A cross-sectional descriptive analysis of the UK living donor registry between 2006 and 2017 (15 June, 2020)
Phillippa K Bailey, Katie Wong, Matthew Robb, Lisa Burnapp, Alistair Rogers, Aisling Courtney, Caroline Wroe

Original research: Socioeconomic inequalities in the prevalence of complex multimorbidity in a Norwegian population: findings from the cross-sectional HUNT Study (15 June, 2020)
Kristin Hestmann Vinjerui, Ottar Bjerkeset, Johan H Bjorngaard, Steinar Krokstad, Kirsty A Douglas, Erik R Sund

Protocol: Role of the intelligent exercise rehabilitation management system on adherence of cardiac rehabilitation in patients with coronary heart disease: a randomised controlled crossover study protocol (15 June, 2020)
Linqi Xu, Wenji Xiong, Jinwei Li, Hongyu Shi, Meidi Shen, Xin Zhang, Yue Pang, Yuanyuan Ni, Wei Zhang, Yuewei Li, Lirong Guo, Shuang Zhang, Lijing Zhao, Feng Li

Original research: Prevalence of multimorbidity with frailty and associations with socioeconomic position in an adult population: findings from the cross-sectional HUNT Study in Norway (15 June, 2020)
Kristin Hestmann Vinjerui, Pauline Boeckxstaens, Kirsty A Douglas, Erik R Sund

Original research: A questionnaire study of the negative outcomes for UK health professional volunteers in low and middle income countries (15 June, 2020)
Natasha Tyler, Helen Louise Ackers, Anya Ahmed, Ged Byrne, Lucie Byrne-Davis

Protocol: Randomised controlled trial assessing the effect of a technology-assisted gait and balance

training on mobility in older people after hip fracture: study protocol (15 June, 2020)
Elvira Maranesi, Giovanni Renato Riccardi, Fabrizia Lattanzio, Mirko Di Rosa, Riccardo Luzi, Elisa Casoni, Nadia Rinaldi, Renato Baldoni, Valentina Di Donna, Roberta Bevilacqua

Correction: What are the links between evidence-based medicine and shared decision-making in training programs for junior doctors? A scoping review protocol (15 June, 2020)

Protocol: Study protocol for a nationwide Knowledge, Attitudes and Practices (KAP) survey on diabetes in Singapore's general population (15 June, 2020)
PV AshaRani, Edimansyah Abdin, Roystonn Kumarasan, Fiona Devi Siva Kumar, Saleha Shafie, Anitha Jeyagurunathan, Boon Yiang Chua, Janhavi Ajit Vaingankar, Sum Chee Fang, Eng Sing Lee, Rob Van Dam, Siow Ann Chong, Mythily Subramaniam

Original research: Efficiency and scale effect of county public hospitals in Shandong Province, China: a cross-sectional study (15 June, 2020)
Qian Li, Liqi Tian, Xiaolin Jing, Xianghua Chen, Jiangfeng Li, Huixin Chen

Original research: Key factors influencing the prescribing of statins: a qualitative study among physicians working in primary healthcare facilities in Indonesia (15 June, 2020)
Sylvi Irawati, Sari Prayudeni, Riris Rachmawati, I Wayan Wita, Bob Willfert, Eelko Hak, Katja Taxis

Protocol: Patient-centred and family-centred care of critically ill patients who are potential organ donors: a qualitative study protocol of family member perspectives (15 June, 2020)
Katina Zheng, Stephanie Sutherland, Pierre Cardinal, Maureen Meade, Angele Landriault, Brandi Vanderspank-Wright, Sabira Valiani, Sam Shemie, Amber Appleby, Sean Keenan, Matthew Weiss, Kim Werestiuk, Andreas H Kramer, Joann Kawchuk, Stephen Beed, Sonny Dhanani, Giuseppe Pagliarello, Michaël Chasse, Ken Lotherington, Mary Gatien, Kim Parsons, Jennifer Chandler, Peter Nickerson, Jim Kutsogiannis, Aimee J Sarti

Protocol: Understanding implementation success: protocol for an in-depth, mixed-methods process evaluation of a cluster randomised controlled trial testing methods to improve detection of Lynch syndrome in Australian hospitals (15 June, 2020)
April Morrow, Katherine M Tucker, Tim J Shaw, Bonny Parkinson, Charles Abraham, Luke Wolfenden, Natalie Taylor

Protocol: Effectiveness of breathing exercises, foot reflexology and back massage (BRM) on labour pain, anxiety, duration, satisfaction, stress hormones and newborn outcomes among primigravidae during the first stage of labour in Saudi Arabia: a study protocol for a randomised controlled trial (15 June, 2020)
Kamilya Jamel Baljon, Muhammad Hibatullah Romli, Adibah Hanim Ismail, Lee Khuan, Boon How Chew

Original research: Systematic review and meta-analysis of prognostic factors of acute exacerbation of idiopathic pulmonary fibrosis (15 June, 2020)
Hiroyuki Kamiya, Ogee Mer Panlaqui

Protocol: Effect and safety of gemtuzumab ozogamicin for the treatment of patients with acute myeloid leukaemia: a systematic review protocol (15 June, 2020)
Nor A Muhamad, Nor S Mohd Dali, Aliza Mohd Yacob, Mohd S A Kassim, Noor A Lodz, S F Abdul Wahid, Tahir Aris

« FIRST ‹ PREVIOUS ... 4 5 6 7 8 9 10 11 12
NEXT › LAST »

Website Terms & Conditions
Privacy & Cookies
Contact BMJ
Cookie settings

Online ISSN: 2044-6055 Print ISSN: 2044-6055

Copyright © 2024 BMJ Publishing Group Ltd. All rights reserved.

# BMJ Open

**COUNTRY**

United Kingdom

Universities and research institutions in United Kingdom

Media Ranking in United Kingdom

**SUBJECT AREA AND CATEGORY**

Medicine

Medicine (miscellaneous)

**PUBLISHER**

BMJ Publishing Group

BMJ Group in Scimago Institutions Rankings

**H-INDEX**

160

**PUBLICATION TYPE**

Journals

**ISSN**

20446055

**COVERAGE**

2011-2023

**INFORMATION**

Homepage

How to publish in this journal

info.bmjopen@bmj.com

**SCOPE**

BMJ Open is a medical journal. We consider papers addressing research questions in clinical medicine, public health and epidemiology. We also welcome studies in health services research, health economics, surgery, qualitative research, research methods, medical education, medical publishing and any other field that directly addresses patient outcomes or the practice and delivery of healthcare. Our focus is on research that is relevant to patients and clinicians. We do not publish studies conducted in animals, laboratory studies not linked to patient outcomes, papers reporting solely physiological or biomechanical results from healthy participants, anatomy, cell biology or non-clinical psychology. All research study types are considered, from study protocols through phase I trials to meta-analyses. This includes specialist studies and studies reporting negative results.

Join the conversation about this journal

Quartiles

FIND SIMILAR JOURNALS

options

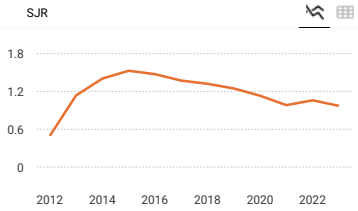
1 **Trials** GBR 74% similarity

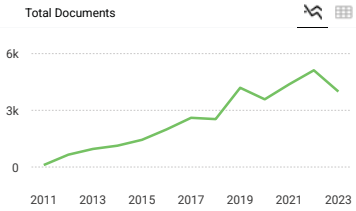
2 **Pilot and Feasibility Studies** GBR 73% similarity

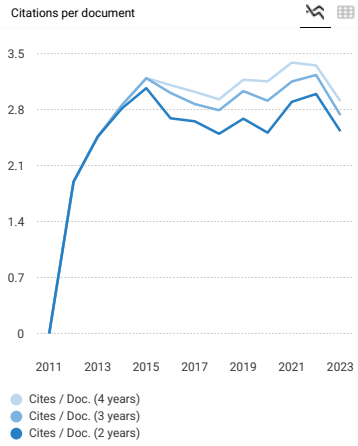
3 **Public Health** NLD 72% similarity

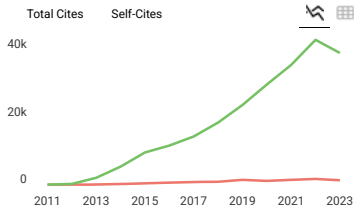
4 **Public Health Reviews** CHE 71% similarity

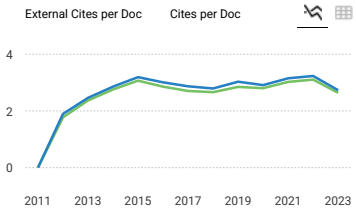
5 **eClinicalMedicine** GBR 71% similarity

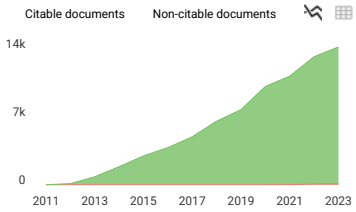


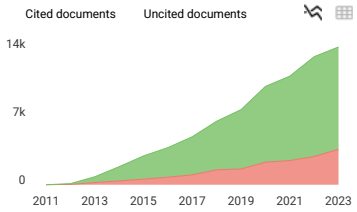



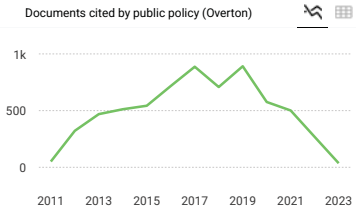



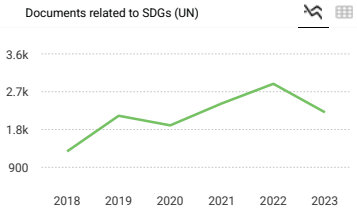



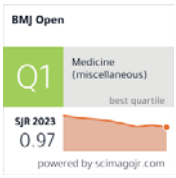








← Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scima
```

**SCImago Graphica**

Explore, visually communicate and make sense of data with our new data visualization tool.

Metrics based on Scopus® data as of March 2024

M **Me sirvió de mucha ayuda para la clasificación de revistas de alto impacto** 4 months ago

Buenas noches, le saluda cordialmente Esther Chávez Cachay, vivo en el Dpto de junín, Perú. Estoy estudiando el II ciclo del doctorado en Salud Pública en la Universidad nacional del Callao, Perú.

reply

SCImago Team

**Melanie Ortiz** 4 months ago

Dear Esther, thanks for your participation! Best Regards, SCImago Team

L **Luis Armando** 5 years ago

Buenas tardes soy el Dr. Ríos Valdepeña, soy residente en Medicina del Trabajo y Ambiental y estoy interesado en realizar una publicación en su revista, pero quisiera saber el costo para este fin.

Que tenga un excelente tarde.....

reply

SCImago Team

E **Estefania Herran Paez** 5 years ago

Estimado Doctor Ríos:
Gracias por escribirnos.

Lamentamos informarle que SCImago Journal & Country Rank no es una revista. SJR es un portal con indicadores cienciométricos de revistas indexadas en Elsevier / Scopus razón por la cual, desafortunadamente, no podemos ayudarle con su solicitud.
Le sugerimos visitar el sitio web de la revista (específicamente información para autores) o que comunicarse con el personal editorial de la revista, para que puedan informarle correctamente.

Saludos cordiales,
Equipo SCImago

**Leave a comment**

Name

Email
(will not be published)

Submit

The users of Scimago Journal & Country Rank have the possibility to dialogue through comments linked to a specific journal. The purpose is to have a forum in which general doubts about the processes of publication in the journal, experiences and other issues derived from the publication of papers are resolved. For topics on particular articles, maintain the dialogue through the usual channels with your editor.

Developed by: SCImago

Powered by: Scopus

Follow us on @ScimagoJR

Scimago Lab, Copyright 2007-2024. Data Source: Scopus®

EST MODUS IN REBUS
Horatio (Satire 1,1,106)

Legal Notice

Privacy Policy

# Source details

## BMJ Open

*Open Access*

Years currently covered by Scopus: from 2011 to 2025

Publisher: BMJ Publishing Group

E-ISSN: 2044-6055

Subject area: Medicine: General Medicine

Source type: Journal

View all documents > | Set document alert | Save to source list

CiteScore 2023
4.4

SJR 2023
0.971

SNIP 2023
0.895

CiteScore | CiteScore rank & trend | Scopus content coverage

### CiteScore 2023

$$4.4 = \frac{74{,}438 \text{ Citations } 2020 - 2023}{16{,}986 \text{ Documents } 2020 - 2023}$$

Calculated on 05 May, 2024

### CiteScoreTracker 2024

$$4.5 = \frac{77{,}585 \text{ Citations to date}}{17{,}349 \text{ Documents to date}}$$

Last updated on 05 February, 2025 • Updated monthly

### CiteScore rank 2023

| Category | Rank | Percentile |
|---|---|---|
| Medicine | | |
| General Medicine | #117/636 | 81st |

View CiteScore methodology > | CiteScore FAQ > | Add CiteScore to your site

## About Scopus

What is Scopus

Content coverage

Scopus blog

Scopus API

Privacy matters

## Language

日本語版を表示する

查看简体中文版本

查看繁體中文版本

Просмотр версии на русском языке

## Customer Service

Help

Tutorials

Contact us

ELSEVIER

Terms and conditions Privacy policy Cookies settings

All content on this site: Copyright © 2025 Elsevier B.V., its licensors, and contributors. All rights are reserved, including those for text and data mining, AI training, and similar technologies. For all open access content, the relevant licensing terms apply.
We use cookies to help provide and enhance our service and tailor content.By continuing, you agree to the use of cookies.

RELX™