South Afr J Anaesth Analg. 2022;28(5 Suppl 1):S113-116
https://doi.org/10.36303/SAJAA.2022.28.5.2901
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South Afr J Anaesth Analg
ISSN 2220-1181 EISSN 2220-1173
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# Equitable resource allocation

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Disparities in the allocation of healthcare resources are ubiquitous to most health systems in the world. Universal health coverage will remain a slogan as long as healthcare resources are not distributed equitably across all population groups. Decision-makers and healthcare practitioners have to be aware of the existing inequity and should encourage the use of evidence-based methods when allocating health resources.

**Keywords:** equity, allocation, resources

## Introduction

The production of quality health care in a population requires the combination and utilisation of many resources. These resources include health financing, workforce, infrastructure, information, technologies, governance and medicines. These resources in South Africa, like anywhere else in the world, are limited.[1] Equity in the allocation of these resources is paramount for effective and efficient distribution of health care in an equal manner among population groups regardless of their social, economic, demographic classes, or geographic location.[2]

The concept of universal health coverage (UHC) was introduced in 2010 by the World Health Organization (WHO) in view of the scarcity of health resources, in an attempt to reduce inequity in the distribution of health. The aim of UHC is to help different countries to develop healthcare systems of quality which will be capable of providing equitable distribution of health resources to the needy and not only to those who can pay, while protecting those who cannot pay from any financial risk.[3,4]

The South African constitution guarantees the right to health care to every human being living in South Africa regardless of their location within the country and their socio-economic class. Despite this constitutional provision, South Africa is among countries with the most inequitable allocation of health resources. There is an imbalance between financial resource allocation and healthcare expenditure to match the needs of the majority of the population. Almost 50% of total health expenditure is spent on 16% of the population covered by medical schemes, while the other 50% of health expenditure is spent on 84% of the population in the public health sector.[5] Within the public health sector, rural populations are often disadvantaged in accessing health care compared to the populations in urban areas. The introduction of National Health Insurance (NHI) by policymakers aimed to address these disparities in the provision of health care among different layers of South African society.[6,7]

Healthcare resources will always be limited as there is a limit to the number of facilities that can be constructed, the number of instruments that can be manufactured, the number of theatres that can be operational on a daily basis, or the number of healthcare workers that can be employed.[1] When health resources are limited and the demands for health care begin to outweigh the supply, equitable allocation of resources is necessary for a fair, effective and efficient distribution of health care to the needy. Healthcare practitioners, including anaesthesiologists, can play a major role in reducing and eliminating health disparities with the aim of achieving health equity.[2,8]

## What is equitable resource allocation?

In 1971, the philosopher Rawls brought up the theory of distributive justice which provided a solid foundation for the concept of equity and resource allocation for health. He was the pioneer for an equal distribution of all vital economic goods and services.[9]

The concept of equity is multidimensional and is based on principles of distributive justice. There is equity when there is absence of correctable differences among population groups defined socially, economically, demographically, or geographically.[8] Equity in health implies the absence of obvious disparities in health or its social determinants in the same population due to their social, economic, demographic and geographic categorisation.[10] Different strategies have been advocated in an attempt to offer every individual a fair and just opportunity to be as healthy as possible.[8]

Resource allocation is the process of identifying and managing resources (financing, workforce, infrastructure, information, technologies, governance and medicines) needed for the production and delivery of health care. These resources are distributed among populations, programmes, and individuals. This process happens at macro and micro levels in society. The rationing of resource allocation at macro-level determines the

overall budget and involves health authorities from national or regional government, while rationing of resource allocation at micro-level involves individual clinicians and patients.[11]

Resource allocation is equitable when the same resource is presented to individuals with the same need. Equity in resource allocation requires that individuals with the same need have the same resource (horizontal equity) and that individuals with greater need have access to more resources (vertical equity). Therefore, assessing equity involves evaluating the match between supply and demand, namely resource allocation and need.[10]

Health inequity creeps in when there are differences in healthcare access or utilisation, quality of care, or health outcomes that are considered avoidable and unfair, such as those associated with socio-economic status, ethnicity or geographical location.[2]

Publicly funded systems face budget constraints, and they have to decide how and where to distribute and utilise funds. In the healthcare sector, groups of individuals and institutions must decide how and where these funds should be distributed. This decision-making process occurs at multiple levels, and includes multiple entities, public and private, such as committees, hospitals, medical equipment, health insurance, and health-related programmes. Institutions then have to decide how and where to allocate these resources and services to individuals and groups of people.[9]

## Why equitable resource allocation?

The pre-democratic South Africa was characterised by gross disparities regarding access to health care. These disparities had race as foundation. Numerous reforms have taken place since 1994, aiming at rectifying these disparities. These reforms include the constitution of the country, the reconstruction and development programme (RDP), the health charter and the white paper on transforming health service delivery.[5,12]

The constitution of South Africa recognises health as a fundamental right, holding the government accountable in creating equity in access to health care for all groups of the population. Therefore, equitable access to health care is widely seen as a high priority for reducing inequitable health status within the country.

The RDP of 1994 was viewed as the cornerstone of government policy. Its main objective was the development of a national health system offering affordable health care to all.[13] Health charter represents an agreement between the public, private and non-governmental organisations to transform the healthcare system in South Africa in assuring access and equity to healthcare services.[14] In 1997, the white paper on transforming health service delivery (Batho Pele principles) was launched in South Africa and aimed to transform the public service, including healthcare services at all levels.[14]

The scarcity of resources needed for the provision of health coupled with the ever-increasing needs for health care, require healthcare policymakers to allocate these resources equitably to allow the bridging of the resource pooling and service providing function. Careful resource allocation of resources between different groups of the population is needed to avoid or rectify inequities. To avoid inequities, healthcare policymakers should base resource allocation on the need of population, prognosis, equal treatment and cost-effectiveness.[2]

The allocation of resources should be guided by the need of the population. The greater the need of the population for health care, the more resource need to be allocated to address those needs and the population in lesser need should be allocated fewer resources.[11] The allocation of resources should be based on the prognosis of the intervention for which resources are needed. The more beneficial the health intervention for the population is, the more resources should be allocated for these interventions. Resource allocation should be cost-effective by matching a prioritised need with a prioritised intervention. This will allow health policymakers to spend the necessary resource for a particular intervention.[8]

## How to achieve equitable resource allocation?

The millennium goal of universal health coverage cannot be achieved with the current configuration of the healthcare system. An equitable distribution of healthcare resources represents a significant step toward reaching the goal of health for all.[15] There are steps that can help decision-makers to equitably allocate resources, preventing inequalities between different population groups. These steps include the assessment of level of health inequalities, assessment of health expenditure benefit to poorest and the assessment of cost-effectiveness of health interventions in addressing inequality.[8]

## Assessment of the level of inequality

The assessment of the level of inequality represents the starting point when attempting to allocate healthcare resources equitably. Measurements such as gap measures, regression-based measures, Lorenz and concentration curves, measures incorporating inequality aversion and health-related social welfare can be used as tools to estimate the level of inequality.[8]

Gap measures help in assessing inequality by measuring the average level of health care utilisation which represents the number of visits to a healthcare facility, and the household assets of a sample of the population. Absolute and relative gaps can be calculated by matching the average level of utilisation in population subgroups to the level of household assets.[8]

Regression-based measures assess inequality by plotting the utilisation of health care on the y-axis and household assets on the x-axis. A line predicting changes in utilisation of health care to changes in wealth by joining the two factors and can be interpreted as the difference in utilisation of health care between different sub-groups of the population. The slope of that line represents the slope index of inequality and the relative inequality index will be obtained by dividing the slope index by mean utilisation. Multivariate regression analysis can be used

when more than two variables are included. This will result in multiple equity-relevant characteristics and control variables.

Lorenz and concentration curves are more complex and incorporate more health variables resulting in richer and more informative measures of inequality.[16]

Measures incorporating inequality aversion capture how much we care about reducing inequality. Specific weights are attached to each individual or population group and the weights are combined with respective health variable value and summed up to produce an index score.[17]

### Assessment of health expenditure benefit to the poorest

The assessment of government health expenditure towards the poor represents the next step when trying to correct inequity in the distribution of healthcare resources. This assessment can be achieved by using some statistical analysis such as benefit incidence analysis (BIA) and marginal benefit incidence analysis (MBIA).[18]

BIA has been used for more than three decades by the World Bank and many other countries to assess the repartition of health expenditure between different population groups within the public healthcare sector. BIA is obtained by calculating the extent to which different socio-economic groups within a population benefited from public healthcare expenditures. These benefits are expressed in monetary units by multiplying the utilisation rate of different types of health services by their unit costs.[18]

MBIA was introduced to show the population groups that benefited from additional expenditure. It is calculated by estimating the statistical relationship between benefit incidence for each social group and public health expenditure.[8]

### Effectiveness of government health expenditure for the promotion of equity

#### *Regional funding formulae*

The allocation of resources to different healthcare entities can be done either via regional funding formulae or based on historical precedent, the last being the current way of allocating financial resources in SA. When the historical precedent is used for regional budget allocation, previous year regional or provincial budget is used as a benchmark plus new allowances due to inflation. The use of historical precedent as a mean of allocating budget perpetuates historical inequities and is influenced by favouritism or political importance.[5]

The use of a needs-based approach has proven to take into consideration equity when allocating budget. This approach has shown its efficacy in the United Kingdom where it was first used in 1970 before expanding to other developed and developing countries.[11] Regional funding formulae allocate resources based on the health needs of each geographical area as well as other indicators such as population size, demographic composition of the population, direct measure of the burden of disease, and indirect measures (socio-economic status of the population and rural population). The incorporation of all these indicators into needs-based formulae will result in target equity allocation specific to each geographic area.[5,11]

The steps when allocating budget using a needs-based approach are:

- Estimation of utilisation-weighed population (population needs for health care) by weighing the population based on its demographic composition:
  - District's population (age and sex group) x health care utilisation rate (age and sex group).
  - District age-sex utilisation rates.
- Estimation of population target equity by weighing of utilisation weighted population:
  - Addition of other indicators of need.
  - Percentage share of each region weighed population of the total.
- Estimation of district population covered by private medical schemes
  - Population size X percentage of each district's population covered by medical schemes.
- Estimation of cost of providing care in rural vs urban areas.[11]

#### *Health benefits packages*

Health benefits packages (HBPs) offer an alternative method to traditional formulae when defining area-level allocations. HPBs detail which healthcare services are to be funded from a set of health resources, therefore, providing a way to estimate health resource needs by linking the costs of providing services with expected target patient population.[8]

#### *Health system reforms*

Equity in resource allocation can be achieved by changing the design of the health system either through financing mechanisms or the organisation of healthcare services. These reforms aim at increasing access to health care and/or providing financial protection to citizens. The increased access to health care can be achieved by the introduction of community-based healthcare centres, investing in primary health care while the provision of financial protection to citizens can be achieved by introducing social health insurance schemes.[8]

### Health interventions with best value for money in reducing inequality

Decision-makers have both the responsibility of allocating resources equitably as well as spending the allocated resource in an equitable manner. While an equitable resource allocation of financial resources can be achieved by using a needs-based formula, an equitable expenditure of resources can be achieved by studying the probability of specific interventions and policies to impact on inequality in the delivery of health care. The economic evaluation of these interventions can provide

quantitative evidence of each intervention and their impact on health inequalities.[10]

The cost-effectiveness analysis compares the benefits to the opportunity cost of the health intervention. The benefits of health intervention are expressed in terms of health gains while the opportunity cost represents health lost from not funding other interventions for the average patient.[1,19]

The extended cost-effectiveness analysis (ECEA) and the distributional cost-effectiveness analysis (DCEA) consider equity in the economic evaluation of health interventions by applying weights to health benefits and opportunity cost according to the characteristics of the recipient. The analysis of the distribution of the impact within the population of the intervention is the fundamental difference between the DCEA, ECEA and the traditional cost-effectiveness analysis.[20,21]

## Conclusion

Universal health coverage driven by the WHO cannot be reached without equitable distribution of healthcare resources. Equitable allocation of health resources can be achieved by understanding the level of inequalities existing within the healthcare system and by using the best methods promoting equity while allocating resources.


### Acknowledgement

I would like to acknowledge the Head of the Anaesthetic Department at Chris Hani Baragwanath Academic Hospital, Dr Palesa Mogane, for her continuous support.



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## References


1. Sperry RJ. Principles of economic analysis. Anesthesiology. 1997;86(5):1197-205. https://doi.org/10.1097/00000542-199705000-00022.
2. Diallo MS, Tan JM, Heitmiller ES, Vetter TR. Achieving greater health equity: a opportunity for anesthesiology. Anesth Analg. 2022;134(6):1175-84. https://doi.org/10.1213/ANE.0000000000005937.
3. Cometto G, Buchan JM, Dussault G. Developing the health workforce for universal coverage. Bull World Health Organ. 2020;98(2):109-16. https://doi.org/10.2471/BLT.19.234138.
4. Berman P, Azhar A, Osborn EJ. Towards universal health coverage: governance and organisational change in ministries of health. BMJ Global Health. 2019;4(5):e001735. https://doi.org/10.1136/bmjgh-2019-001735.
5. Stuckler D, Basu S, McKee M. Health care capacity and allocation among South Africa's provinces: infrastrucyure-inequality traps after the end of Apartheid. Am J Public Health. 2011;101(1):165-72. https://doi.org/10.2105/AJPH.2009.184895.
6. Blecher M, Daven J, Harrison S, et al. National Health Insurance vision, challenges and potential solutions. South African Health Review; 2020.
7. Omotoso K, Koch SF. Assessing changes in social determinants of health inequalities in South Africa: a decomposition analysis. Int J Equity Health. 2018;17(1):181. https://doi.org/10.1186/s12939-018-0885-y.
8. Love-Koh J, Griffin S, Kataika E, et al. Methods to promote equity in health resource allocation in low- and middle-income: an overview. Globalization and Health. 2020;16(1):6. https://doi.org/10.1186/s12992-019-0537-z.
9. Ekmekci PE, Arda B. Enhancing John Rawls's theory of justice to cover health and social determinants of health. Acta Bioeth. 2015;21(2):227-36. https://doi.org/10.4067/S1726-569X2015000200009.
10. Abu Al-Saad N, Skedgel C, Nortje J. Principles of resource allocation in critical care. BJA Educ. 2017;17(12):390-5. https://doi.org/10.1093/bjaed/mkx029.
11. Maharaj H, Robinson A, McIntyre D. A needs-based approach to equitable allocation of district primary healtcare expenditure in North West Province, South Africa. S Afr Med J. 2018;108(3):190-6. https://doi.org/10.7196/SAMJ.2017.v108i3.12588.
12. Van Rensburg HCJ. South Africa's protracted struggle for equal distribution and equitable access - still not there. Hum Resour Health. 2014;12:26. https://doi.org/10.1186/1478-4491-12-26.
13. Scott V, Schaay N, Schneider H, Sanders D. Addressing social determinants of health in South Africa: the journey continues. South African Health Review; 2017.
14. Brauns M, Stanton A. Reforming the health sector in South Africa - Post 1994. Risk Governance and Control Financial Markets and Institutions. 2015;5(3):167-79. https://doi.org/10.22495/rgcv5i3c2art2.
15. Mathur MR, Williams DM, Reddy KS, Watt RG. Universal health coverage: A unique policy opportunity for oral health. J Dent Res. 2015;94(3 Suppl):S3-5. https://doi.org/10.1177/0022034514565648.
16. Zhang Y, Wang Q, Jiang T, Wang J. Equity and efficiency of primary health care resource allocation in mainland China. Int J Equity Health. 2018;17(1):140. https://doi.org/10.1186/s12939-018-0851-8.
17. Wang X, Zhang Z, Zhao J, Shi Y. Impact of telemedicine on healthcare service system considering patients' choice. Discrete Dyn Nat Soc. 2019;7642176. https://doi.org/10.1155/2019/7642176.
18. Bowser D, Patenaude B, Bhawalkar M, Duran D, Berman P. Benefit incidence analysis in public health facilities in India: utilization and benefits at the national and state levels. Int J Equity Health. 2019;18(1):13. https://doi.org/10.1186/s12939-019-0921-6.
19. Pedersen T. Evidence-based anaesthesia and health economics. Best Pract Res Clin Anaesthesiol. 2006;20(2):347-60. https://doi.org/10.1016/j.bpa.2005.10.001.
20. Mori AT, Kampata L, Musonda P. Cost-benefit and extended cost-effectiveness analysis of a comprehensive adolescent pregnancy prevention program in Zambia: study protocol for acluster randomized controlled trial. Trials. 2017;18(1):604. https://doi.org/10.1186/s13063-017-2350-4.
21. Asaria M, Griffin S, Cookson R. Distributional cost-effectiveness analysis: A tutorial. Med Decis Making. 2016;36(1):8-19. https://doi.org/10.1177/0272989X15583266.