

The Iron Triangle of Healthcare: Cost, Quality, and Access

Posted on October 11, 2022

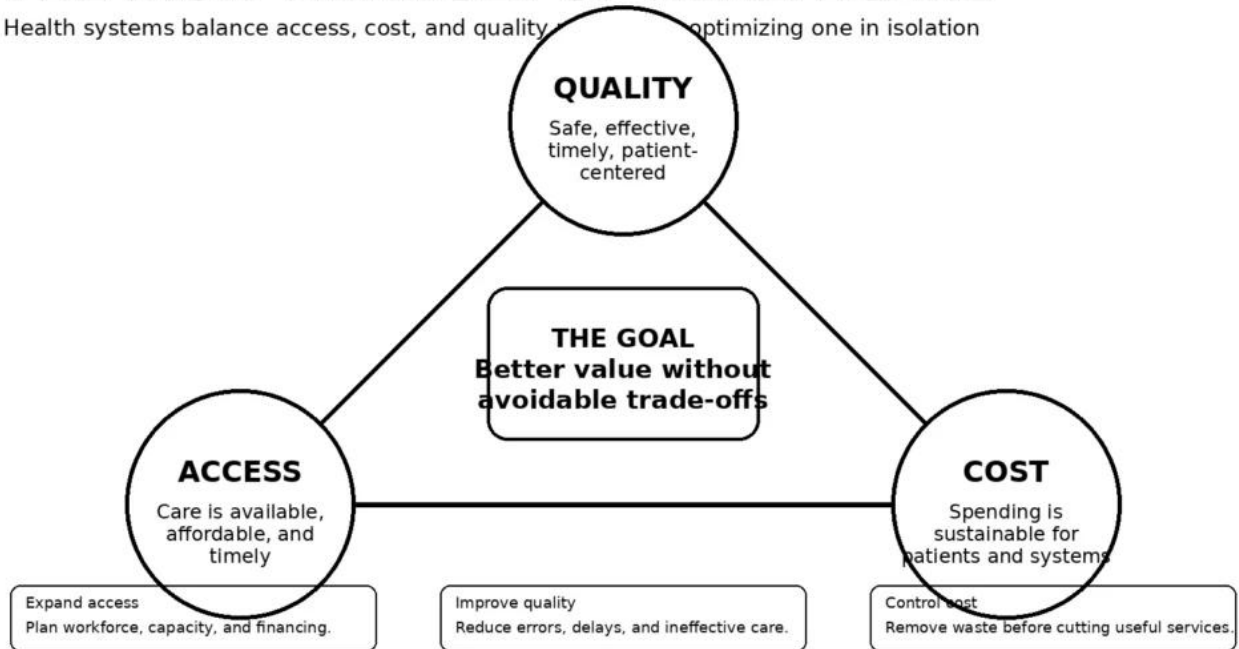
Every healthcare system faces the same difficult question: how can it provide high-quality medical care to as many people as possible without allowing costs to become unaffordable? Governments, hospitals, insurers, employers, and patients may agree that healthcare should be accessible, effective, and reasonably priced. The challenge begins when they must decide how limited money, staff, facilities, medicines, and technology should be distributed.

The iron triangle of healthcare is a framework used to explain this challenge. Its three points are access, cost, and quality. The model suggests that changing one part of a healthcare system can influence the other two. Expanding access may require additional spending. Reducing costs without careful planning may create longer waiting times or reduce service quality. Introducing higher-quality technology may improve outcomes but increase short-term expenses.

The triangle is useful because it reminds policymakers that healthcare decisions have consequences. However, it should not be treated as an absolute law. Better organization, disease prevention, appropriate technology, stronger primary care, and the removal of waste can sometimes improve access, quality, and cost at the same time. The real purpose of the framework is not to discourage improvement. It is to encourage leaders to consider the complete effect of every healthcare decision.

THE IRON TRIANGLE OF HEALTHCARE

Health systems balance access, cost, and quality. Optimizing one in isolation



Origin of the Iron Triangle

The healthcare iron triangle is commonly associated with physician and health policy scholar William L. Kissick. In his 1994 book *Medicine's Dilemmas: Infinite Needs Versus Finite Resources*, Kissick examined the difficulty of satisfying growing healthcare needs with limited resources.

Medical possibilities are constantly expanding. New medicines, diagnostic tests, surgical procedures, and technologies allow professionals to treat conditions that were once untreatable. At the same time, populations are ageing, chronic diseases require long-term management, and patients expect access to increasingly advanced care.

Resources, however, are never unlimited. Even wealthy countries must decide which services to fund, how much to pay healthcare workers, where to build facilities, and which treatments should receive priority. Kissick used the relationship among access, quality, and cost containment to illustrate these difficult choices (Kissick, 1994).

The word "iron" suggests that the relationship is difficult to change. If policymakers expand one side of the triangle, pressure may appear elsewhere. For example, offering a new health service to millions of additional patients can improve access but also require more staff, facilities, medicines, and public spending.

Aaron Carroll later popularized the idea by explaining that healthcare policy regularly involves trade-offs. His discussion emphasized that public promises about universal access, lower costs, and higher quality should be examined carefully rather than accepted without evidence (Carroll, 2012).

What Healthcare Access Means

Access means more than having a hospital somewhere nearby. A person has meaningful access only when appropriate healthcare can be obtained at the right time and without unreasonable financial, geographic, cultural, or administrative barriers.

The Agency for Healthcare Research and Quality defines access as the timely use of personal health services to achieve the best possible health outcomes. It identifies coverage, availability of services, timeliness, and the healthcare workforce as important parts of access (Agency for Healthcare Research and Quality, n.d.-a).

Insurance coverage can help patients enter the healthcare system, but insurance alone does not guarantee access. A patient may technically have coverage yet still be unable to find a physician accepting new patients. Someone living in a rural community may need to travel several hours to see a specialist. Another patient may avoid treatment because of deductibles, transportation expenses, language barriers, or an inability to take time away from work.

Access therefore includes several questions:

- Are qualified professionals available?
- Can patients obtain appointments without dangerous delays?
- Are services located within a reasonable distance?
- Can patients afford fees, medicines, and transportation?
- Are facilities accessible to people with disabilities?
- Can patients understand and communicate with healthcare providers?
- Are services culturally appropriate and respectful?

The World Health Organization connects access with universal health coverage. Under this approach, people should be able to obtain the health services they need without suffering financial hardship. These services include prevention, diagnosis, treatment, rehabilitation, and palliative care across the course of life (World Health Organization, 2025a).

Improving access can require greater spending in the beginning. A healthcare system may need to train more nurses and physicians, open community clinics, expand insurance coverage, or improve transportation and telehealth services. These investments may increase immediate costs, but they can also prevent more expensive medical problems later.

For example, accessible primary care can help patients manage high blood pressure or diabetes

before complications require hospitalization. Access should therefore be evaluated over time rather than measured only by the initial expense of providing a service.

What Healthcare Cost Means

The cost point of the triangle concerns the resources used to provide healthcare. These costs may be paid by patients, governments, employers, insurance companies, charities, or healthcare organizations.

Cost includes more than the price written on a hospital bill. It can include:

- Insurance premiums
- Taxes used to fund public healthcare
- Deductibles and copayments
- Prescription medicine costs
- Medical equipment
- Healthcare salaries
- Hospital construction and maintenance
- Administrative work
- Diagnostic tests
- Emergency services
- Long-term care
- Lost income caused by illness

A service may appear inexpensive to one participant because its cost has been transferred to someone else. A patient may pay a small copayment, while an insurer or public program pays most of the bill. Similarly, reducing government spending may increase the amount patients must pay personally.

Healthcare cost control is important because excessive spending can make coverage unaffordable and limit funding for other public needs. However, reducing expenditure is not automatically beneficial. The method used to reduce costs determines whether patients are helped or harmed.

A hospital might save money by reducing unnecessary tests, preventing medication errors, negotiating better supply prices, and improving coordination between departments. These changes may lower costs without reducing quality.

In contrast, a hospital might reduce costs by cutting nursing staff, closing services, or delaying the replacement of unsafe equipment. These measures may produce immediate financial savings but create longer waiting times, staff exhaustion, medical errors, and preventable readmissions.

The most useful question is therefore not simply, “How can healthcare spending be reduced?” A

better question is, “Which spending produces meaningful health benefits, and which spending represents waste?”

What Healthcare Quality Means

Quality refers to how well healthcare services improve health outcomes and meet accepted professional standards. High-quality care should not be measured only by the availability of advanced machines or expensive treatments.

The Agency for Healthcare Research and Quality identifies six widely used domains of healthcare quality. Care should be safe, effective, patient-centered, timely, efficient, and equitable (Agency for Healthcare Research and Quality, 2025).

Safe care avoids preventable harm. Effective care uses scientific evidence and provides treatment to patients who are likely to benefit. Patient-centered care respects personal needs, values, and preferences. Timely care reduces harmful delays. Efficient care avoids waste. Equitable care does not vary unfairly because of a patient’s location, income, race, ethnicity, sex, or other personal characteristics.

The World Health Organization similarly explains that quality healthcare should be effective, safe, people-centered, timely, equitable, integrated, and efficient (World Health Organization, 2025b).

Several factors influence healthcare quality:

- Staff education and clinical competence
- Adequate numbers of healthcare workers
- Accurate diagnosis
- Safe medication practices
- Clean facilities and infection control
- Reliable equipment
- Communication among professionals
- Respectful treatment of patients
- Evidence-based clinical decisions
- Monitoring of outcomes and errors
- Coordination between different levels of care

A healthcare system may offer broad access but still fail patients if the available services are unsafe or ineffective. A clinic that provides appointments quickly but frequently makes diagnostic errors cannot be considered successful.

Quality must therefore be included whenever access is expanded. Providing more care has little value when the care does not improve health or causes avoidable harm.

How the Three Parts Affect One Another

The iron triangle becomes most useful when access, cost, and quality are considered together.

Suppose a government expands insurance coverage to a large previously uninsured population. Access may improve because more people can afford appointments, tests, and medicines. However, the policy may also increase demand. If the number of healthcare workers and facilities remains unchanged, patients may face longer waits. Spending may rise because more services are being used.

This does not mean that coverage expansion is a mistake. It means that improved financial access should be supported by workforce planning, stronger primary care, and adequate service capacity.

Consider another example involving quality. A hospital may introduce an electronic medication-checking system to reduce prescribing errors. Purchasing and installing the technology may increase short-term costs. Staff will also need training. If the system prevents adverse drug events, however, it may protect patients and reduce the cost of treating avoidable complications.

Cost-cutting policies produce similar interactions. Restricting unnecessary imaging may lower expenditure without harming patients. Restricting medically necessary imaging only to save money may delay diagnosis and reduce quality.

The triangle therefore encourages decision-makers to look beyond the immediate effect of a policy. A change that appears expensive today may save money over several years. A policy that looks inexpensive may create serious future costs.

The Triangle Is Not an Unbreakable Law

The original interpretation of the iron triangle is sometimes summarized by saying that improving one or two points must always damage the remaining point. This explanation is too rigid.

Some trade-offs are real. A health system cannot provide every possible treatment to every person without considering affordability. Nevertheless, efficiency and innovation can sometimes improve all three areas.

A 2021 study examining hospital data found that the relationship among cost, quality, and access was more complex than a completely fixed zero-sum model. The authors concluded that the original framework remained useful but that its relationships should not always be considered rigid or unavoidable (Beauvais et al., 2021).

Consider the prevention of hospital-acquired infections. Better hand hygiene, appropriate use of antibiotics, environmental cleaning, and infection monitoring can improve quality. Preventing

infections also reduces additional treatment costs and makes hospital beds available to other patients. In this case, quality, cost, and access can all improve.

Generic medicines offer another example. When a safe and effective generic alternative becomes available, treatment may become more affordable without reducing clinical quality. Lower prices can then improve access.

Care coordination may produce similar gains. When primary care physicians, specialists, pharmacists, and hospitals share accurate information, patients may avoid duplicated tests and conflicting prescriptions. Better coordination can improve safety while reducing waste.

Research on health programs has also shown that access can be incorporated into return-on-investment planning. Community health workers and health information systems, for example, may require initial investment but potentially produce long-term savings while reaching more patients (van der Goes et al., 2019).

The triangle should therefore be viewed as a starting point for analysis, not as an excuse for accepting poor performance.

Examples of Healthcare Trade-Offs

Several common healthcare decisions demonstrate how the triangle works.

Expanding Rural Healthcare

Opening a rural clinic can improve access for patients who previously travelled long distances. It may also support earlier diagnosis and better management of chronic disease.

However, operating a small facility can be expensive because the number of patients may be too low to spread fixed costs efficiently. Recruiting professionals to rural areas can also be difficult.

A complete policy response may involve telehealth, travelling specialists, community health workers, transportation services, and financial incentives for rural clinicians. The goal is not merely to open a building but to create sustainable access without reducing quality.

Reducing Hospital Staff

Reducing staff may lower payroll costs quickly. Yet insufficient staffing can increase waiting times, burnout, medication errors, falls, infections, and missed care.

These problems may eventually increase expenditure through overtime, staff turnover, legal claims, and avoidable readmissions. A narrow cost-saving decision can therefore weaken both access and

quality.

Introducing New Medical Technology

A new imaging system or surgical device may improve diagnostic accuracy or treatment outcomes. The equipment can also be expensive to purchase, maintain, and operate.

Healthcare leaders must examine whether the technology produces enough benefit to justify its cost. They should also consider whether staff can use it safely and whether investing in the technology will reduce funding for more basic services.

Increasing Appointment Availability

Extending clinic hours can make care more accessible to patients who work during the day. However, this expansion requires enough clinicians and support staff.

If professionals are simply required to work longer without additional support, quality may decline because of fatigue. A better approach would consider staffing, workload, patient demand, and financing together.

Limiting Medication Access

The original article used pain medication restrictions as a simple example of access being reduced to protect quality. The issue is more complicated.

Medication policy must balance access to legitimate treatment with safe prescribing, monitoring, and the prevention of harmful use. Excessively loose controls may create safety problems, while overly restrictive rules may prevent patients with genuine medical needs from receiving appropriate care.

The goal should not be maximum or minimum access. It should be appropriate access based on clinical evidence, patient needs, and effective safeguards.

Healthcare Value and the Triple Aim

The limitations of the iron triangle encouraged healthcare experts to develop additional frameworks.

In 2008, Donald Berwick, Thomas Nolan, and John Whittington introduced the Triple Aim. It calls for the simultaneous improvement of the patient experience, population health, and per-person healthcare cost (Berwick et al., 2008).

The Triple Aim differs from a strictly pessimistic interpretation of the iron triangle. Instead of

assuming that one goal must always be sacrificed, it asks organizations to redesign care so that several goals improve together.

The two models can be used together. The iron triangle warns leaders to anticipate trade-offs. The Triple Aim encourages them to search for coordinated solutions.

Healthcare value is also important. Value is often understood as the health outcome achieved in relation to the resources used. Expensive care may provide good value when it produces major and lasting health improvements. Inexpensive care may provide poor value when it is unnecessary, ineffective, or harmful.

Focusing on value helps move the discussion away from the belief that all spending is bad. The goal is to spend resources where they produce the greatest meaningful benefit.

Why Equity Must Be Considered

Access, cost, and quality are not experienced equally by every population. A national healthcare system may report acceptable average performance while particular communities continue to face serious barriers.

Low-income patients may delay care because of fees. Rural residents may lack nearby specialists. People with disabilities may encounter inaccessible facilities. Minority communities may receive poorer communication or experience discrimination.

Equity therefore deserves explicit attention. A policy can improve overall access while allowing disparities to continue. It can reduce average costs while shifting greater financial burdens onto vulnerable patients.

Modern quality frameworks include equity as an essential dimension rather than treating it as an optional social concern. Healthcare should not vary unfairly because of income, location, race, language, sex, disability, or social status.

Leaders using the iron triangle should ask not only whether access, cost, and quality are changing, but also who benefits and who carries the burden.

How Healthcare Leaders Can Use the Triangle

The iron triangle can guide policy when it is used as a practical decision-making tool.

Before introducing a new program, leaders should ask:

1. How will the policy affect access?

2. Which patients will gain or lose services?
3. What are the short-term and long-term costs?
4. Who will pay those costs?
5. How will the policy affect patient safety and outcomes?
6. Does the current workforce have enough capacity?
7. Could the policy increase health inequalities?
8. How will success or failure be measured?
9. Are there less expensive ways to achieve the same outcome?
10. What unintended consequences might appear?

Decisions should also be evaluated after implementation. A program that appears successful during planning may behave differently in practice. Patient feedback, clinical results, waiting times, workforce data, and financial performance should be monitored together.

It is dangerous to measure only one point. A cost-saving program may appear successful until quality indicators are examined. An access program may appear successful because more appointments are offered, even though patients still face long waits or receive fragmented care.

Balanced measurement helps decision-makers recognize these hidden problems.

The Role of the Public

Patients and the general public should understand that healthcare choices involve limited resources. However, public education should not be used to excuse poor planning, waste, or preventable inequality.

People deserve clear explanations of why certain services are funded, how prices are determined, and what evidence supports healthcare policies. Transparent discussion can build trust and allow communities to participate in decisions that affect them.

Healthcare professionals should not be blamed for every limitation within a health system. Many problems result from financing structures, workforce shortages, administrative requirements, supply limitations, and political decisions beyond the control of individual clinicians.

At the same time, professionals and institutions should remain accountable for safety, ethical conduct, communication, and the responsible use of resources.

Honest public discussion should recognize both realities: healthcare resources are finite, but systems still have a duty to use those resources fairly and effectively.

Conclusion

The iron triangle of healthcare describes the relationship among access, cost, and quality. It helps explain why healthcare policy is difficult and why apparently simple solutions may produce unexpected consequences.

Improving access can increase demand and spending. Reducing costs can damage quality when necessary services or staff are removed. Improving quality may require substantial investment. These trade-offs should be taken seriously.

However, the triangle is not an unbreakable law. Preventive care, generic medicines, safer clinical practices, strong primary care, better coordination, and the reduction of waste can sometimes improve all three areas.

The best healthcare decisions do not focus on one point while ignoring the others. They examine how access, cost, and quality interact over time and across different patient populations.

The framework also needs to be combined with modern concerns such as equity, population health, patient experience, and workforce well-being. A system cannot be considered successful merely because it spends less or treats more patients. It must provide care that is safe, effective, timely, fair, and financially sustainable.

The iron triangle remains valuable because it forces policymakers and healthcare leaders to ask difficult questions. Its message is not that better healthcare is impossible. Its message is that improvement requires evidence, transparency, careful planning, and an honest understanding of consequences.

References

Agency for Healthcare Research and Quality. (2025). *Six domains of healthcare quality*. U.S. Department of Health and Human Services.

Agency for Healthcare Research and Quality. (n.d.-a). *Access to care*. U.S. Department of Health and Human Services.

Beauvais, B., Kruse, C. S., Fulton, L., Brooks, M., Mileski, M., Lee, K., Ramamonjiarivelo, Z., & Shanmugam, R. (2021). Testing Kissick's iron triangle—Structural equation modeling analysis of a practical theory. *Healthcare*, 9(12), 1753. <https://doi.org/10.3390/healthcare9121753>

Berwick, D. M., Nolan, T. W., & Whittington, J. (2008). The Triple Aim: Care, health, and cost. *Health Affairs*, 27(3), 759–769. <https://doi.org/10.1377/hlthaff.27.3.759>

Carroll, A. E. (2012). The “iron triangle” of health care: Access, cost, and quality. *JAMA Forum Archive*, 1(1).

Kissick, W. L. (1994). *Medicine's dilemmas: Infinite needs versus finite resources*. Yale University Press.

van der Goes, D. N., Edwardson, N., Rayamajhee, V., Hollis, C., & Hunter, D. (2019). An iron triangle ROI model for health care. *ClinicoEconomics and Outcomes Research*, 11, 335–348.

<https://doi.org/10.2147/CEOR.S130623>

World Health Organization. (2025a). *Universal health coverage*.

World Health Organization. (2025b). *Quality health services*.