

South African Public
Relationship with Science:
2022 Survey Results



From *Cosmos to Community*: South Africa's Science and Technology Story

Saahier Parker and Sylvia Hannan

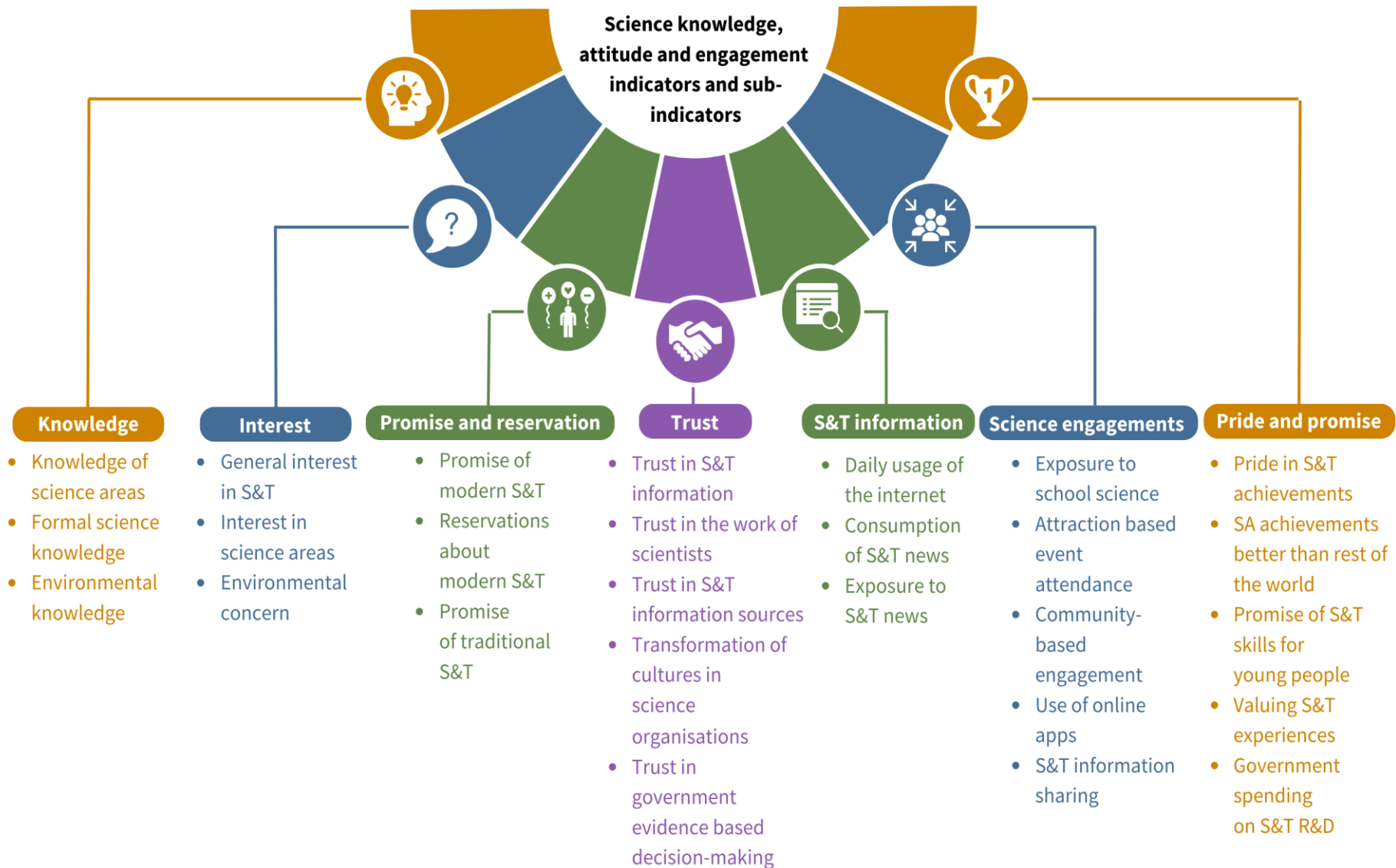
Why is it important to understand the relationship between science and society?

- Science & technology influence and shape daily life
 - Increasingly changing world
- S&T play a role in empowering citizens
 - Engaged, informed, aware society
- Inclusive science–society links are essential for equity & progress
- Digital divides & inequalities
 - Risk of people being left behind
- South Africa's dual population
 - Those with access and opportunities vs. those without

Policy context

- 1996 White Paper on S&T set the scene
- 2015 SES and subsequent plans
- 2019 White Paper on STI: To support a science-literate and science-aware society by increasing (i) the reach of awareness initiatives and (ii) access to S&T information
- To assess progress to achieving the desired outcomes the WP advocated for:
 - ‘A set of indicators to measure the success of science engagement’
 - An institutionalised survey (every 5 years) on public perceptions of science...’
- HSRC mandated to conduct the survey

Indicators and measures



Conceptual framework

DEMOGRAPHY AND CONTEXT

- Age
- Sex
- Educational attainment
- Home education support
- Socio-economic status
- Employment status
- Spatial location
- Religious beliefs
- Population group

SCIENCE KNOWLEDGE AND ATTITUDES TOWARDS S&T

1. SCIENCE
KNOWLEDGE
AND INTEREST

2. PROMISE AND
RESERVATION
TOWARDS
MODERN AND
TRADITIONAL S&T

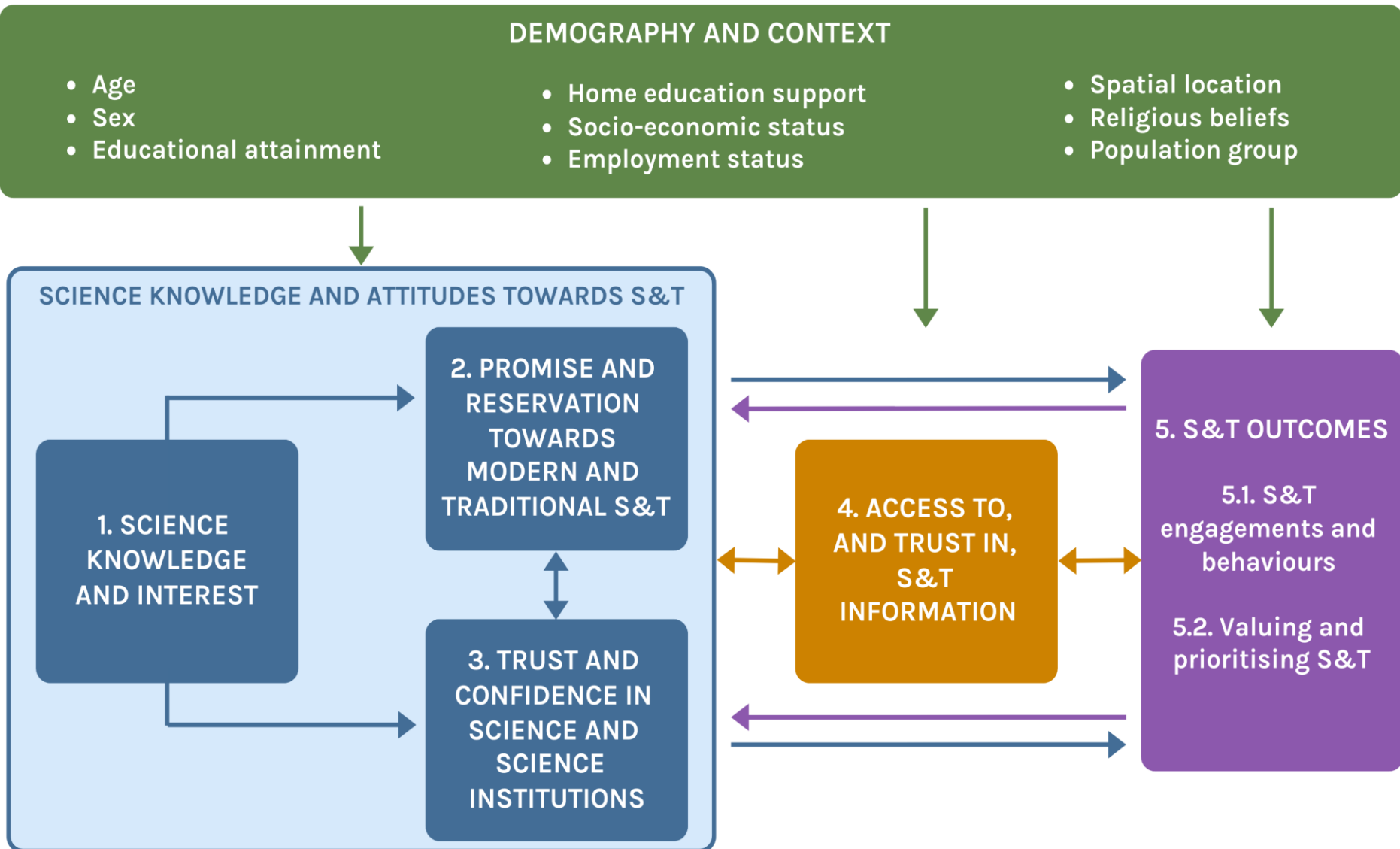
3. TRUST AND
CONFIDENCE IN
SCIENCE AND
SCIENCE
INSTITUTIONS

4. ACCESS TO,
AND TRUST IN,
S&T
INFORMATION

5. S&T OUTCOMES

5.1. S&T
engagements and
behaviours

5.2. Valuing and
prioritising S&T



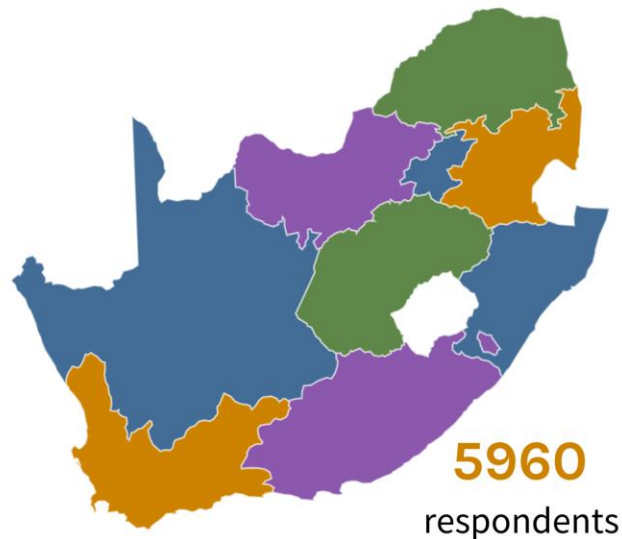
Methodology

Sample population

- Representative sample of the national population
- Adults, 16 years and older
- Selected from 500 areas across the nine provinces

Survey approach

- Conducted by the Human Sciences Research Council (HSRC) through the annual South African Social Attitudes Survey (SASAS)



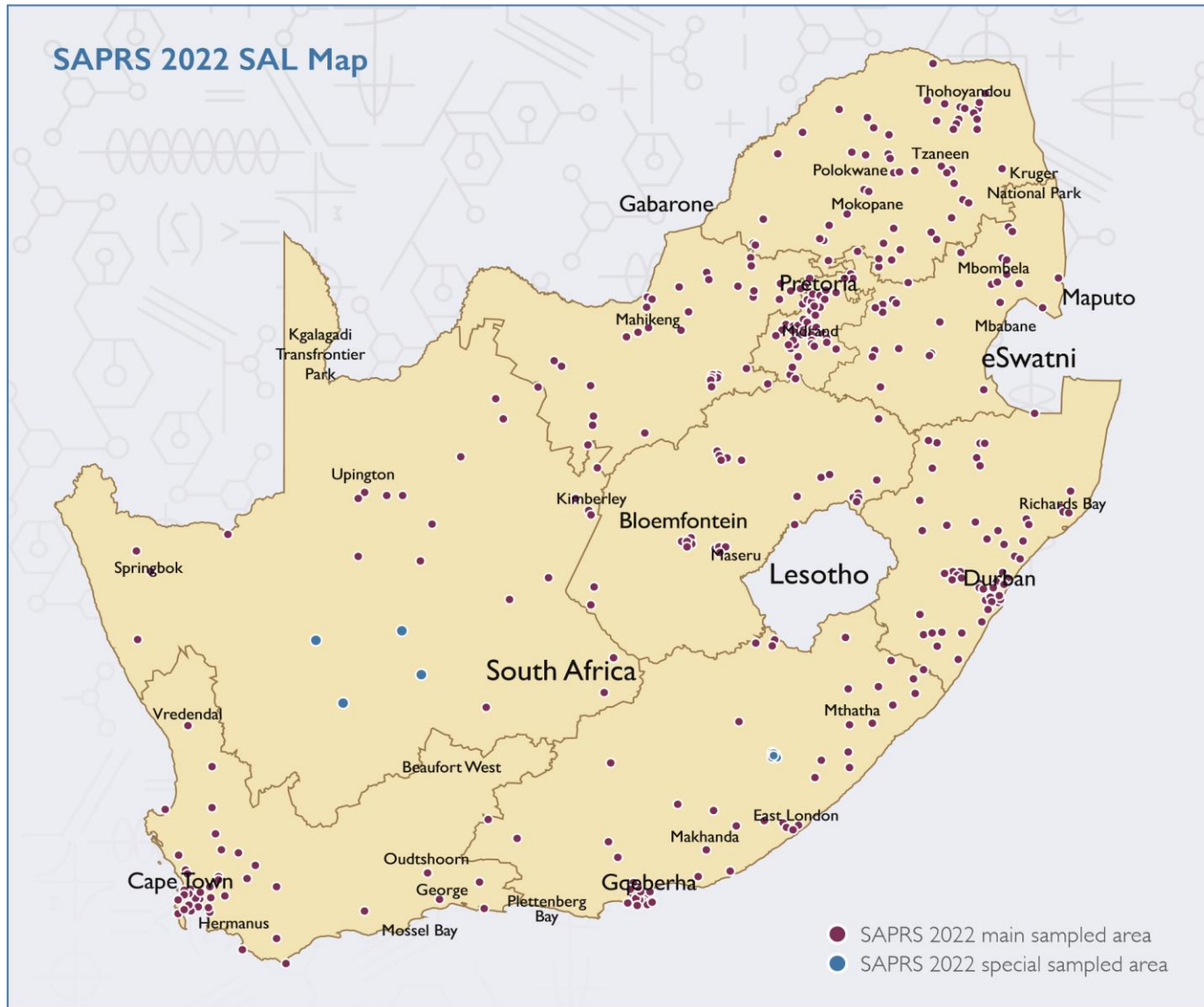
Survey instrument

- 200 items about the public relationship with science
- 28 demographic and contextual items

Survey interviews

- November 2022 - January 2023
- One-hour face-to-face interviews
- Conducted in one of the 11 official languages, based on respondents' preference

Map of 500 sampled SALs



Key findings

Knowledge and Interest in S&T

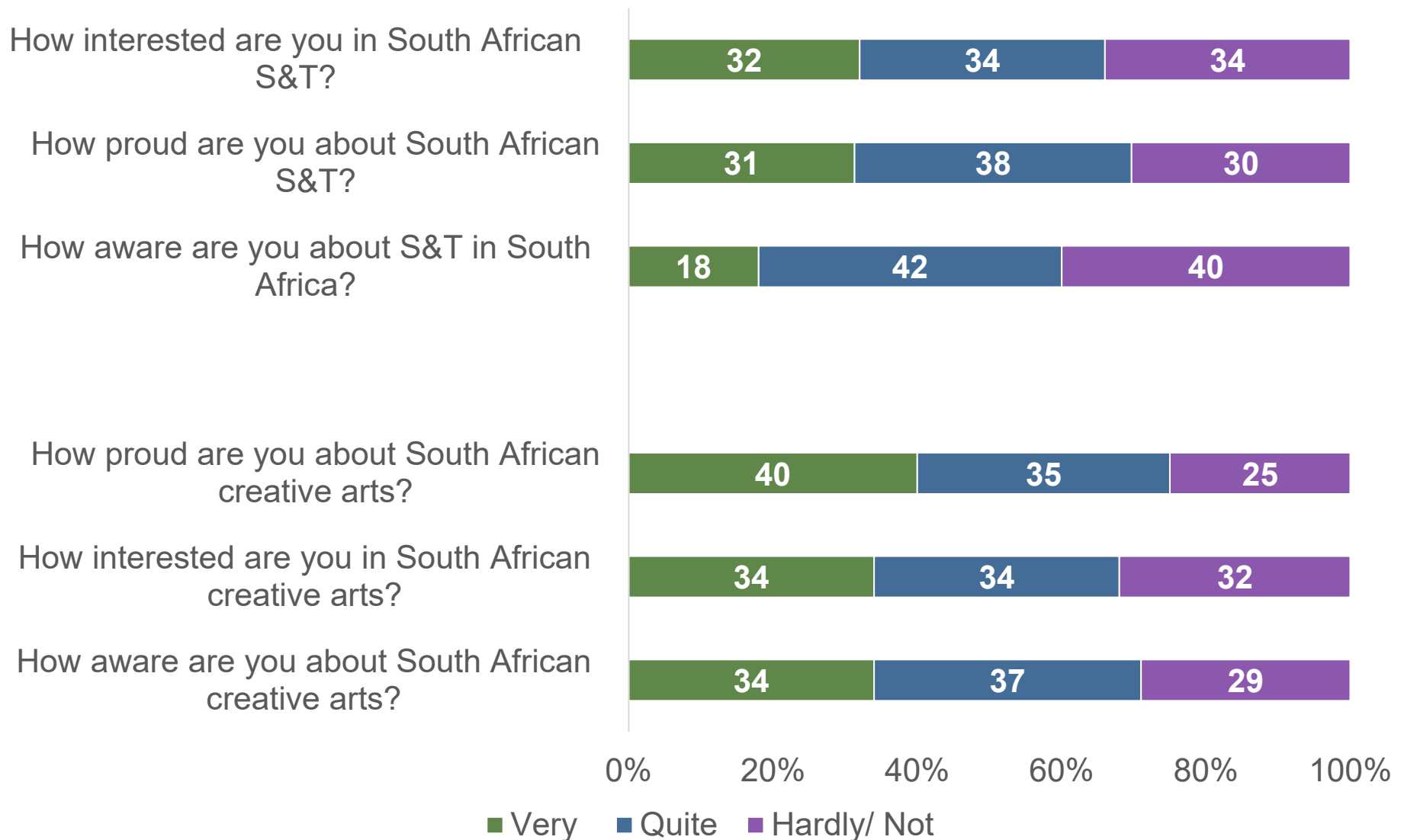
Promise and reservations attitudes about modern and traditional S&T

Trust in science and science institutions

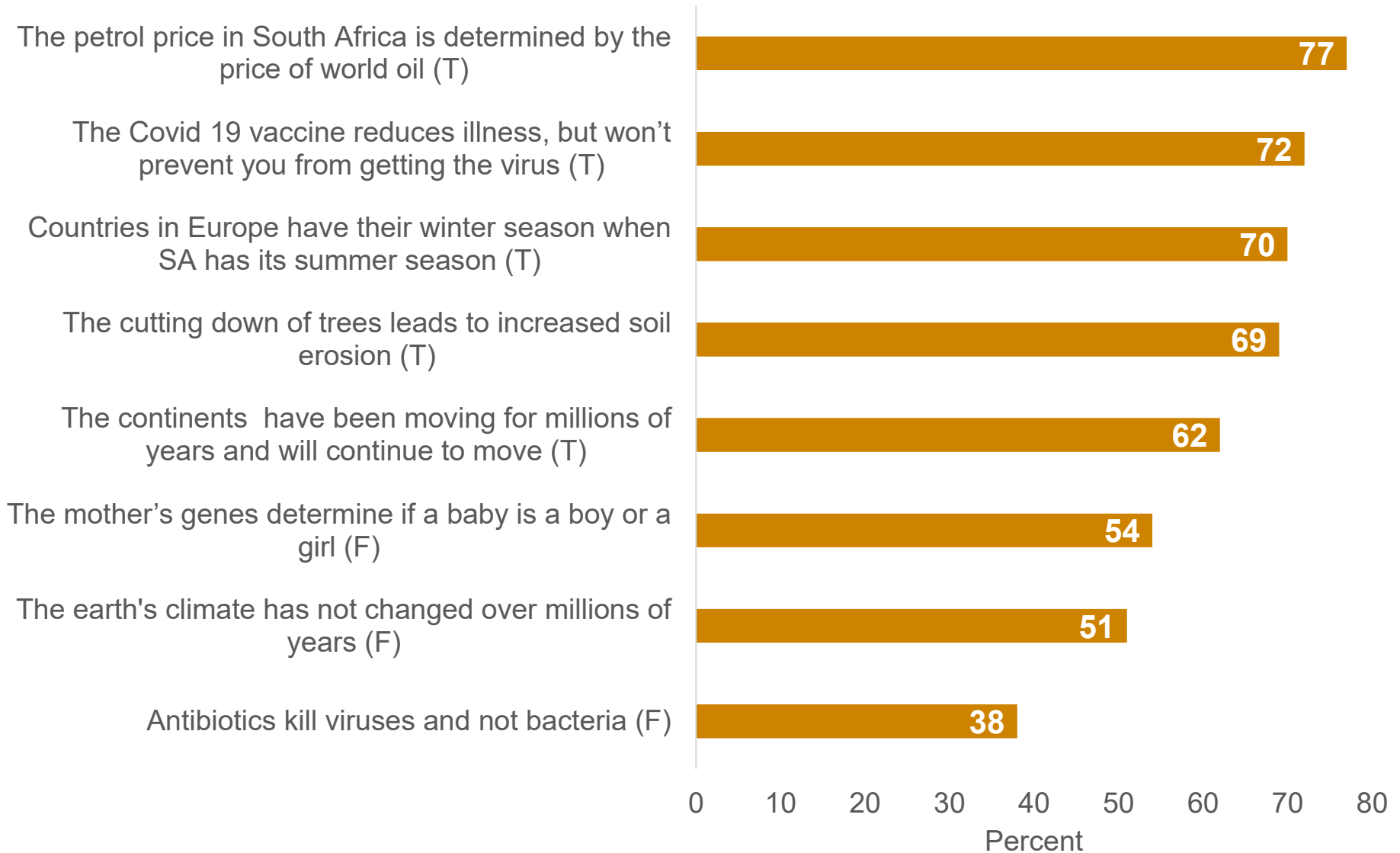
Access to S&T information and trust in information

Science engagement outcomes

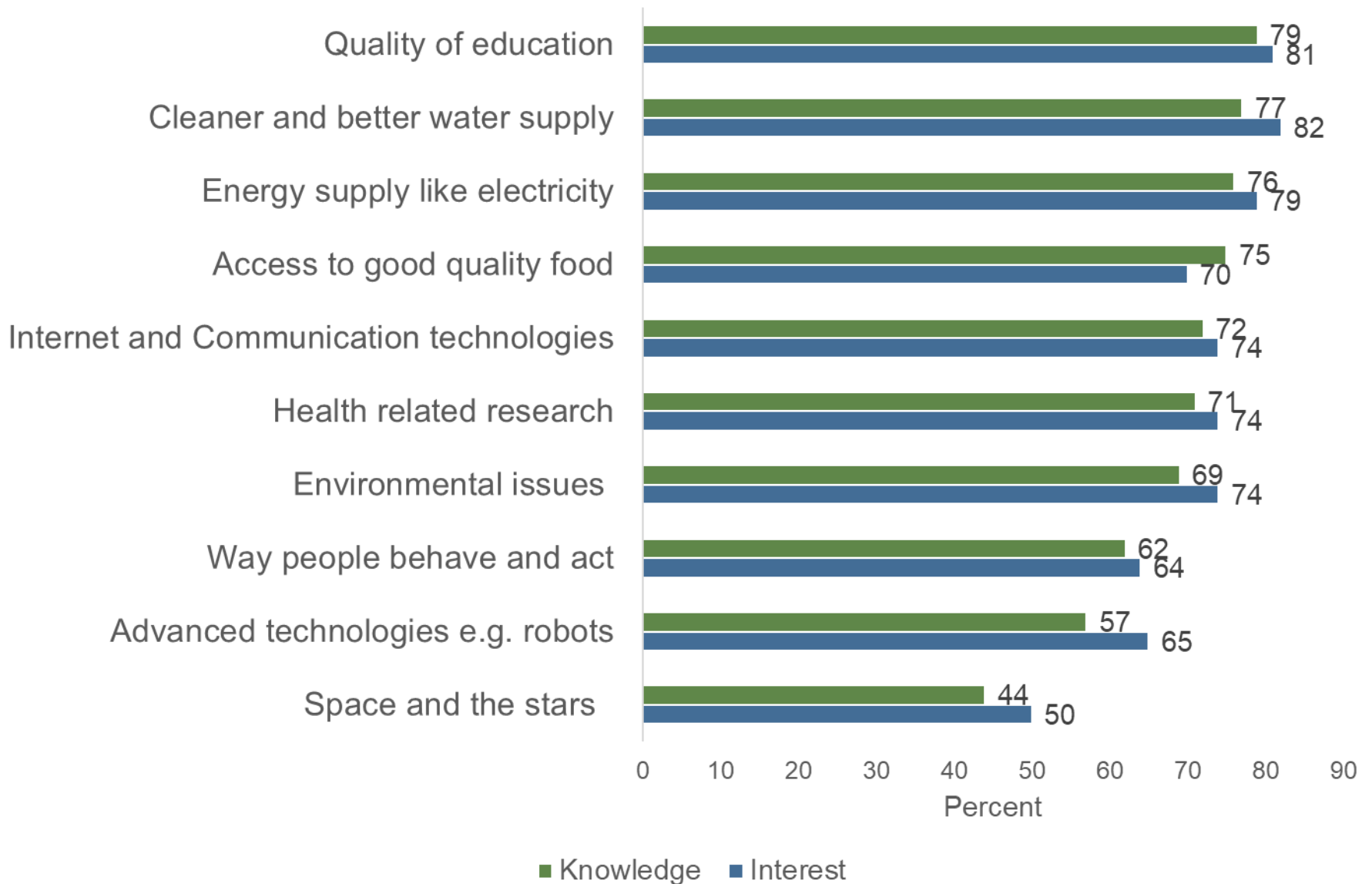
Interest, Awareness and Pride in South African S&T



Science knowledge index



Knowledge of and interest in priority S&T



Promise and reservation towards modern S&T

Promise



76%

S&T are making our lives healthier, easier and more comfortable



74%

S&T will make work more interesting



64%

S&T careers are suitable for women



61%

S&T will create more opportunities for future generations



58%

The benefits of S&T are greater than the harmful effects

Reservation



78%

S&T make our way of life change too fast



68%

New technologies will result in people losing jobs



66%

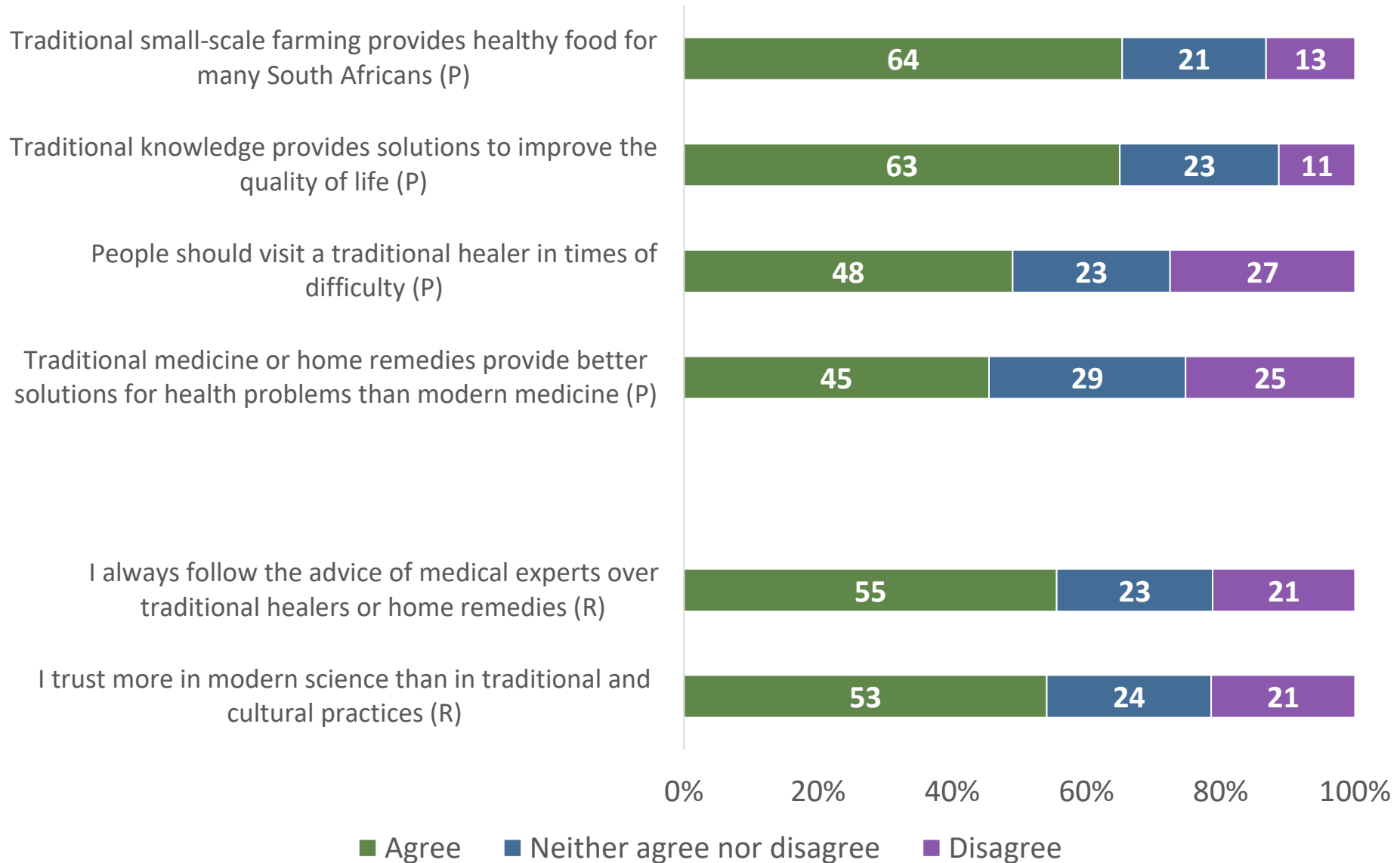
Scientific advances tend to benefit the rich more than the poor



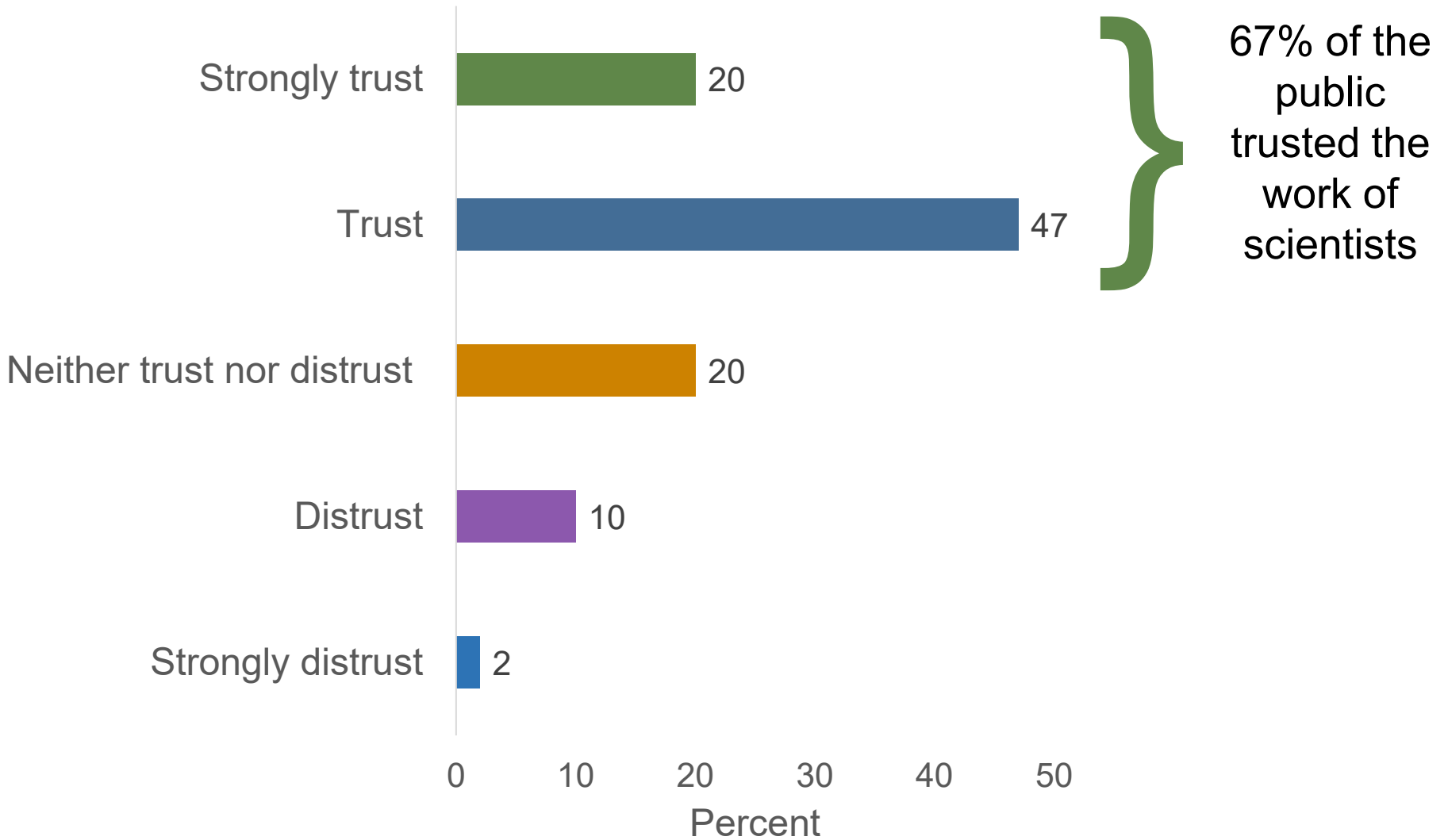
62%

We depend too much on science and not enough on faith or religion

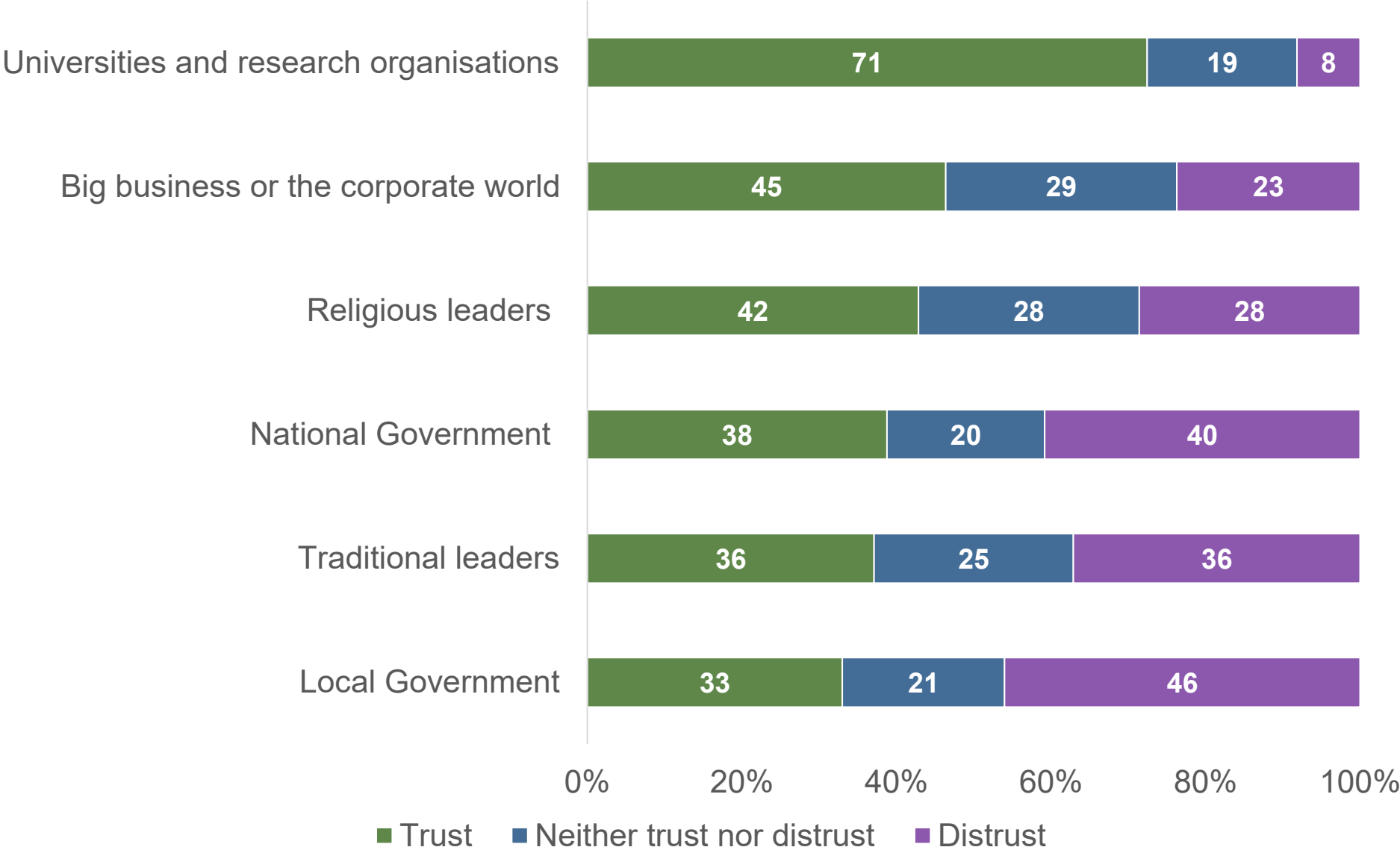
Promise and reservation towards traditional S&T



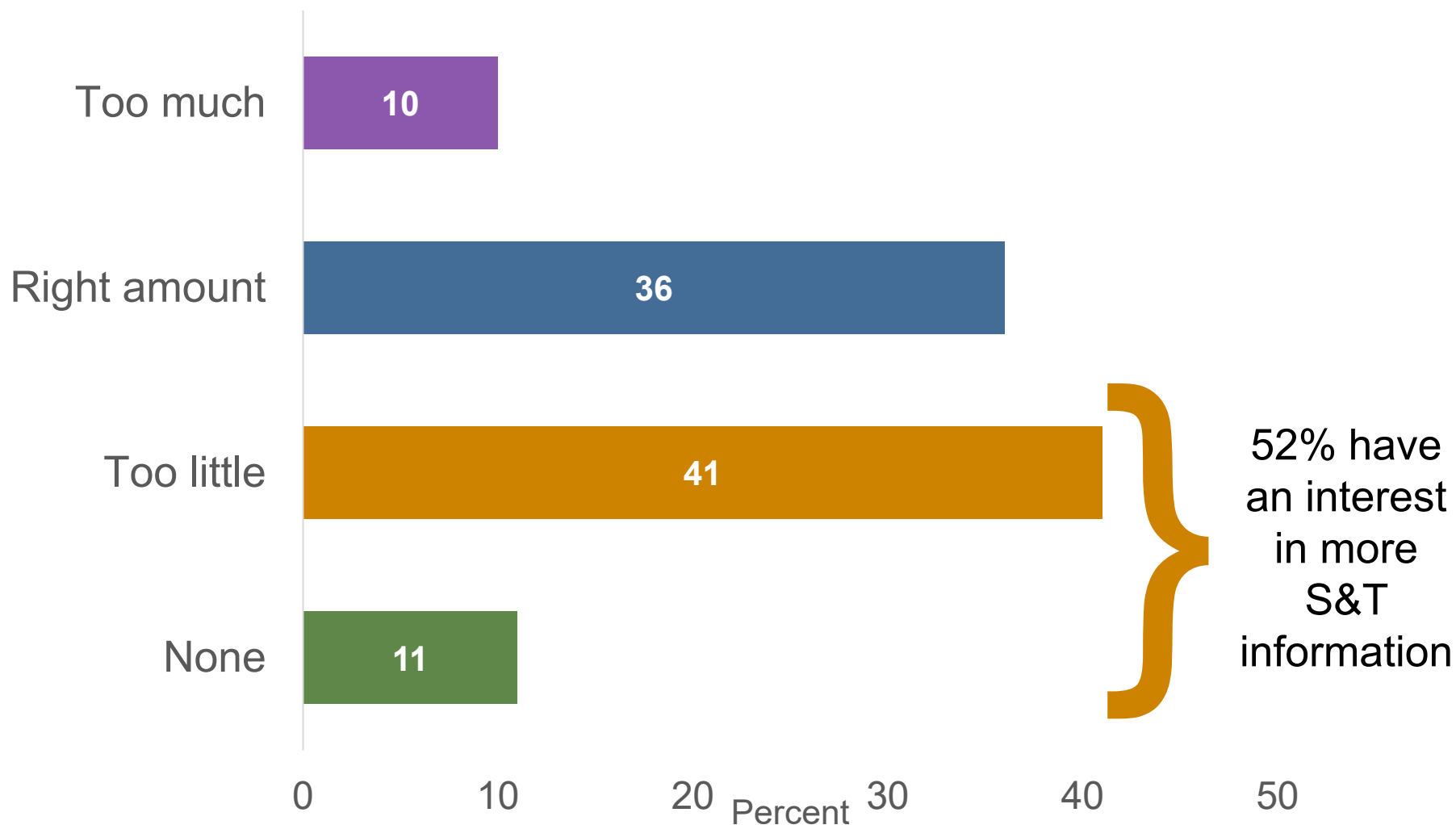
Trust in scientists



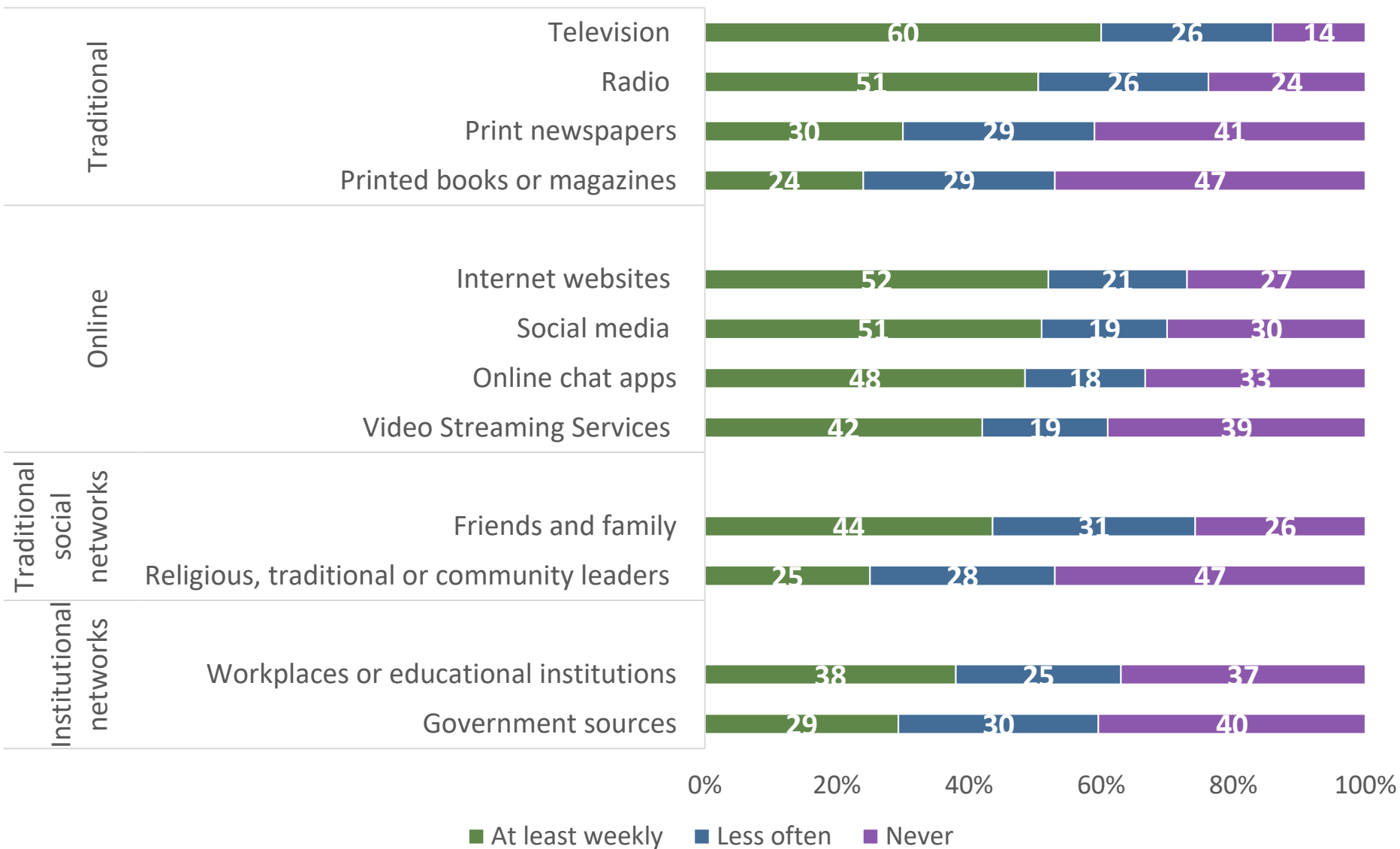
Confidence in S&T information from institutions



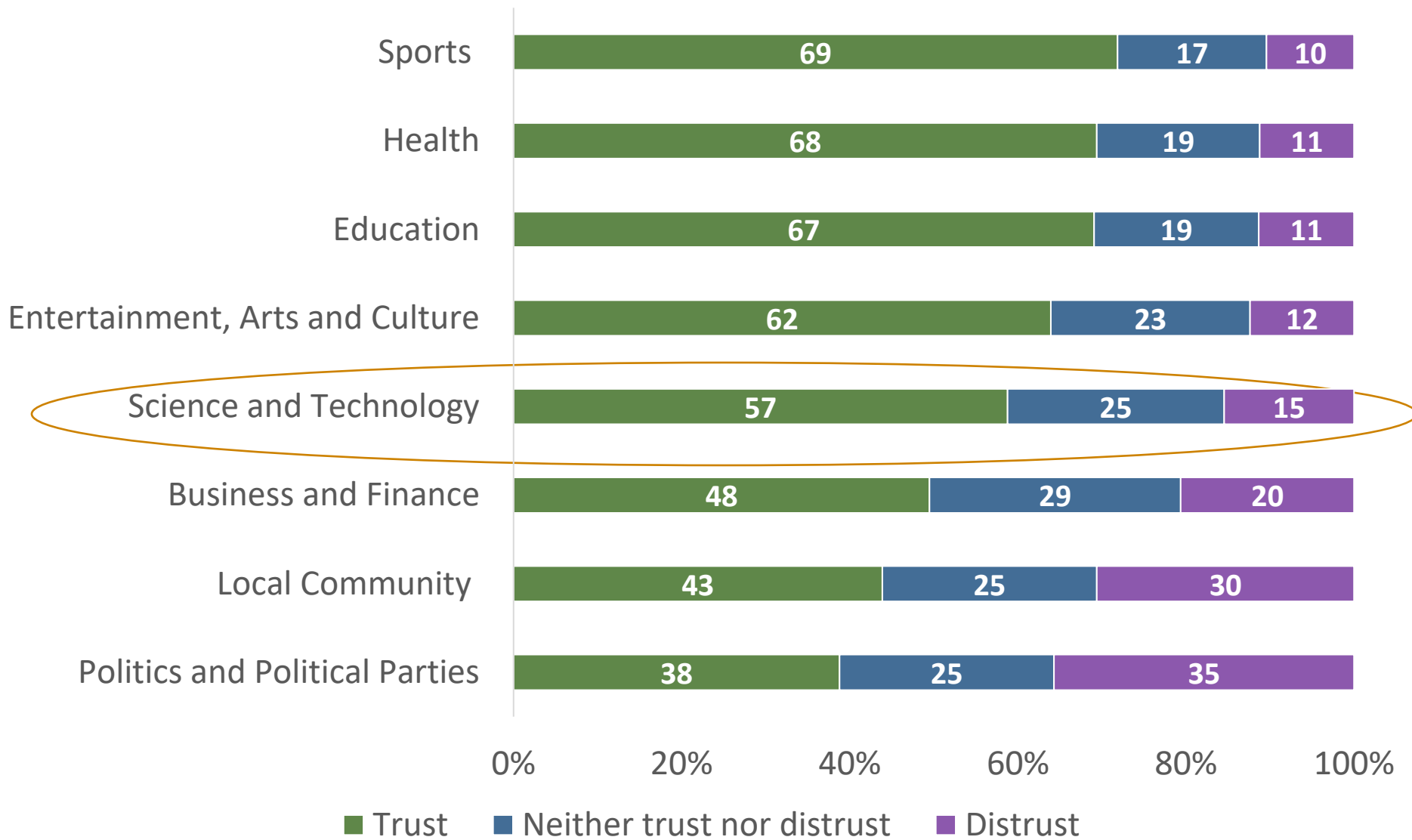
Amount of S&T information the public received



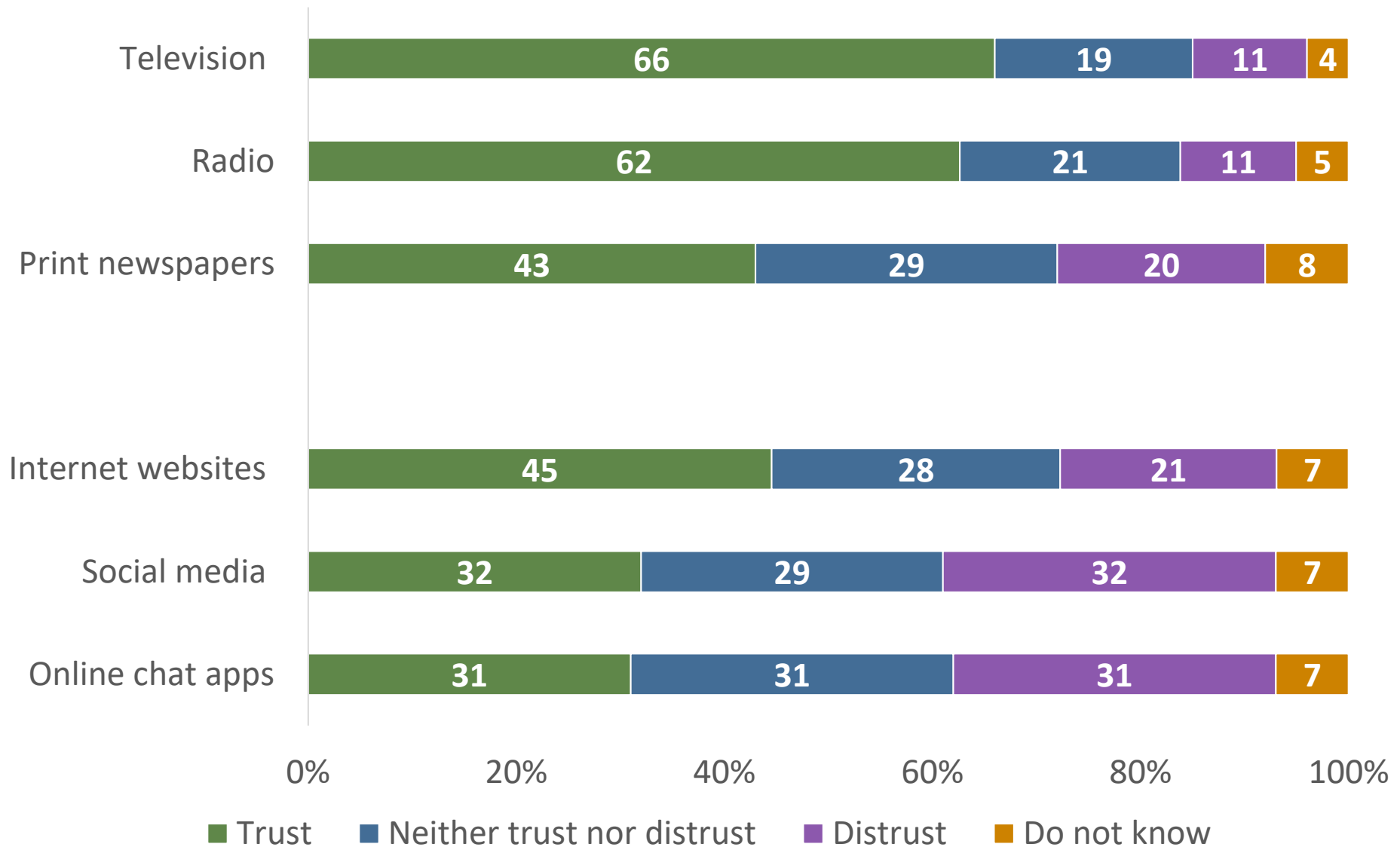
S&T news received from different sources



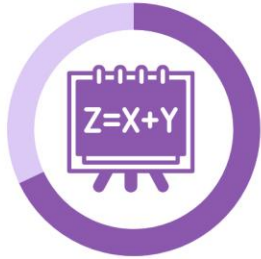
Public trust in specific news content



Trust in S&T news from media sources



STEM and SS exposure



68%

Maths/Maths Literacy



52%

Biology/Life Sciences



39%

Physical Sciences

31% took all 3 STEM subjects after Grade 9



48%

Geography



41%

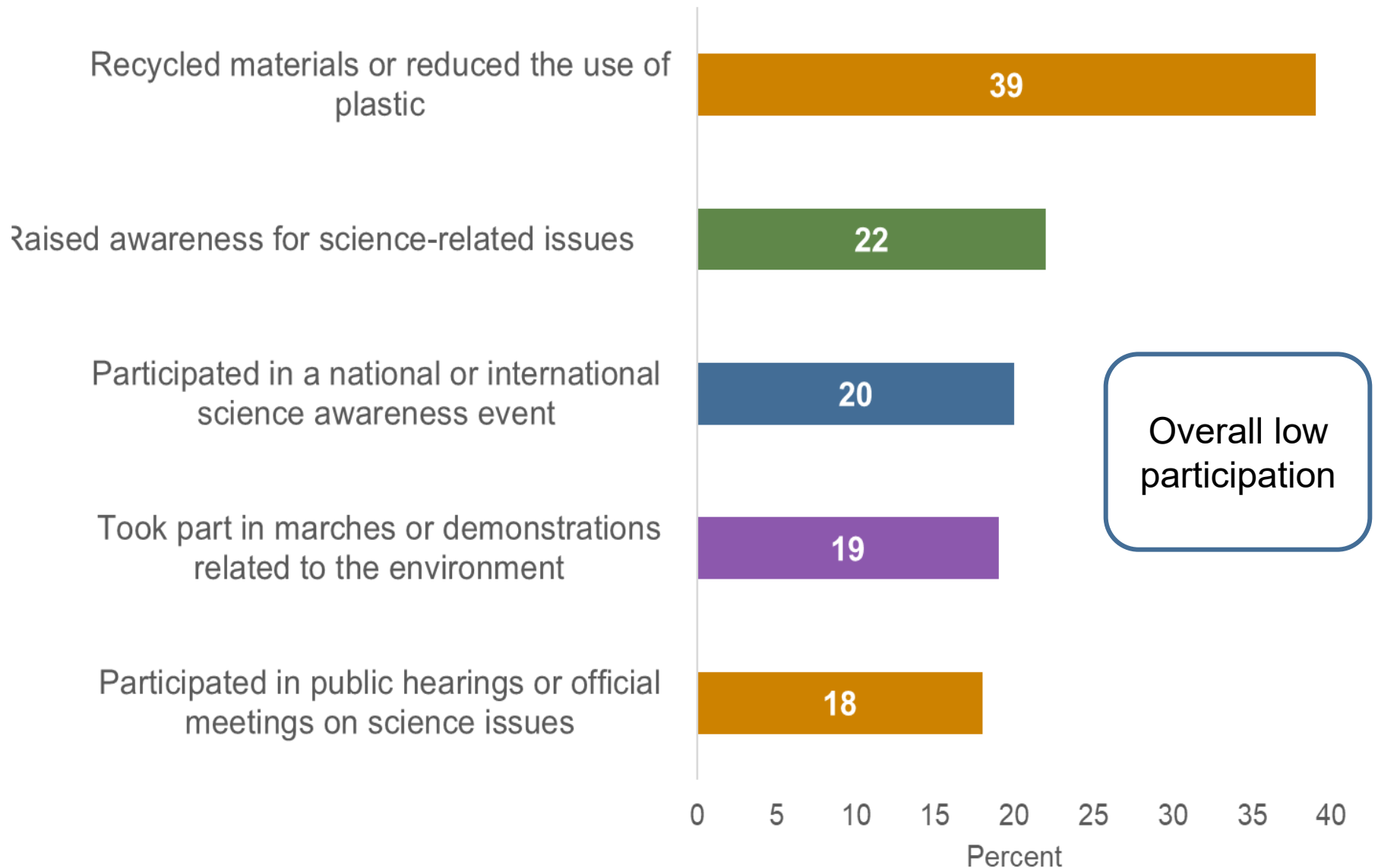
History

32% took Geography and History after Grade 9

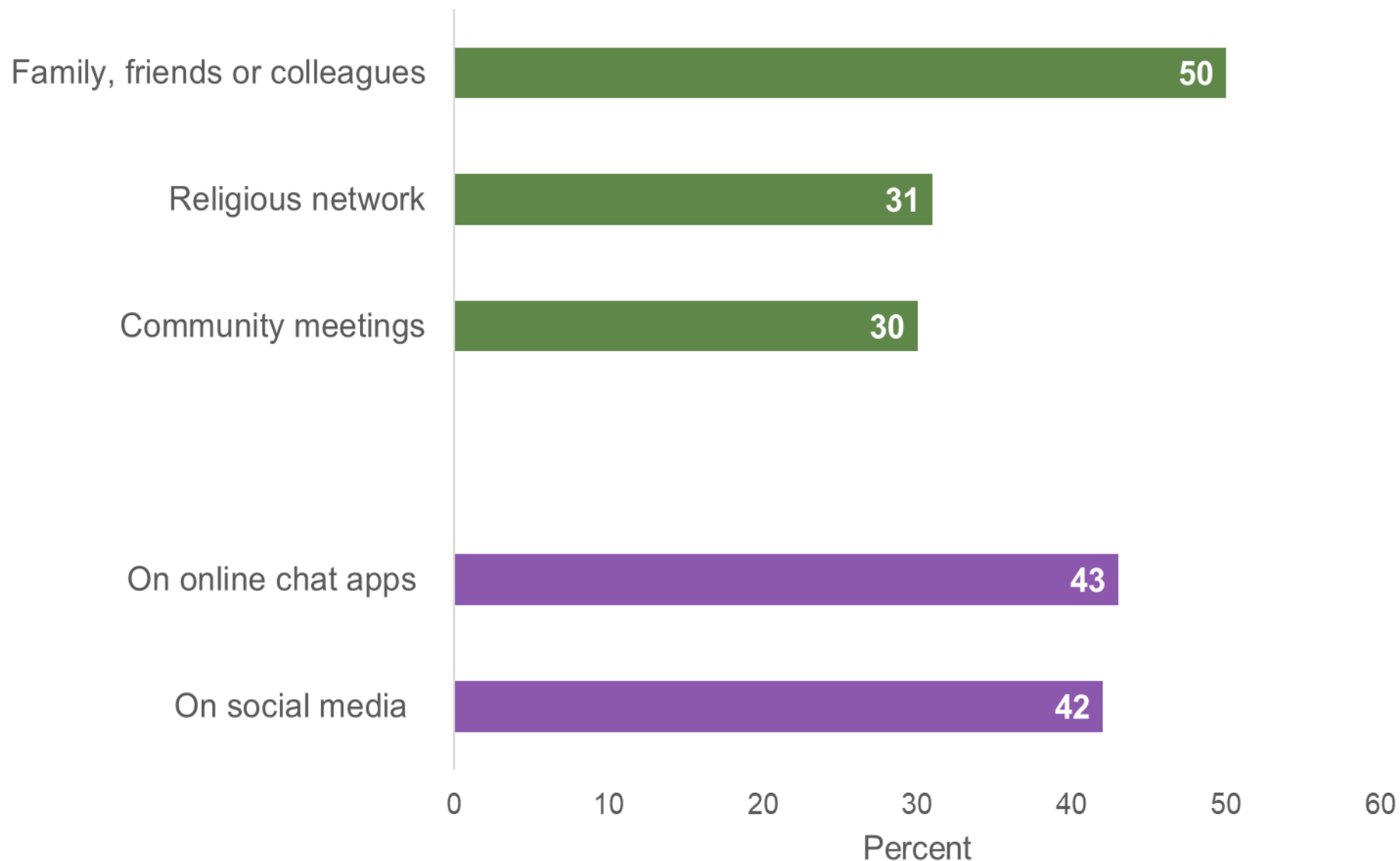
Attendance-based engagement

Science engagement space	Available in area	Attended
Public library	55	30
Public science activities e.g. community clean ups, nature walks	14	18
Museum	12	23
Botanical gardens, nature or game reserve, zoo, aquarium	10	26
Science and Technology Centre or Exhibitions	7	16

Community-based engagement



Sharing S&T information



Use of online apps



58%

Internet banking



34%

Online shopping



34%

Ride sharing applications



29%

Online government services



28%

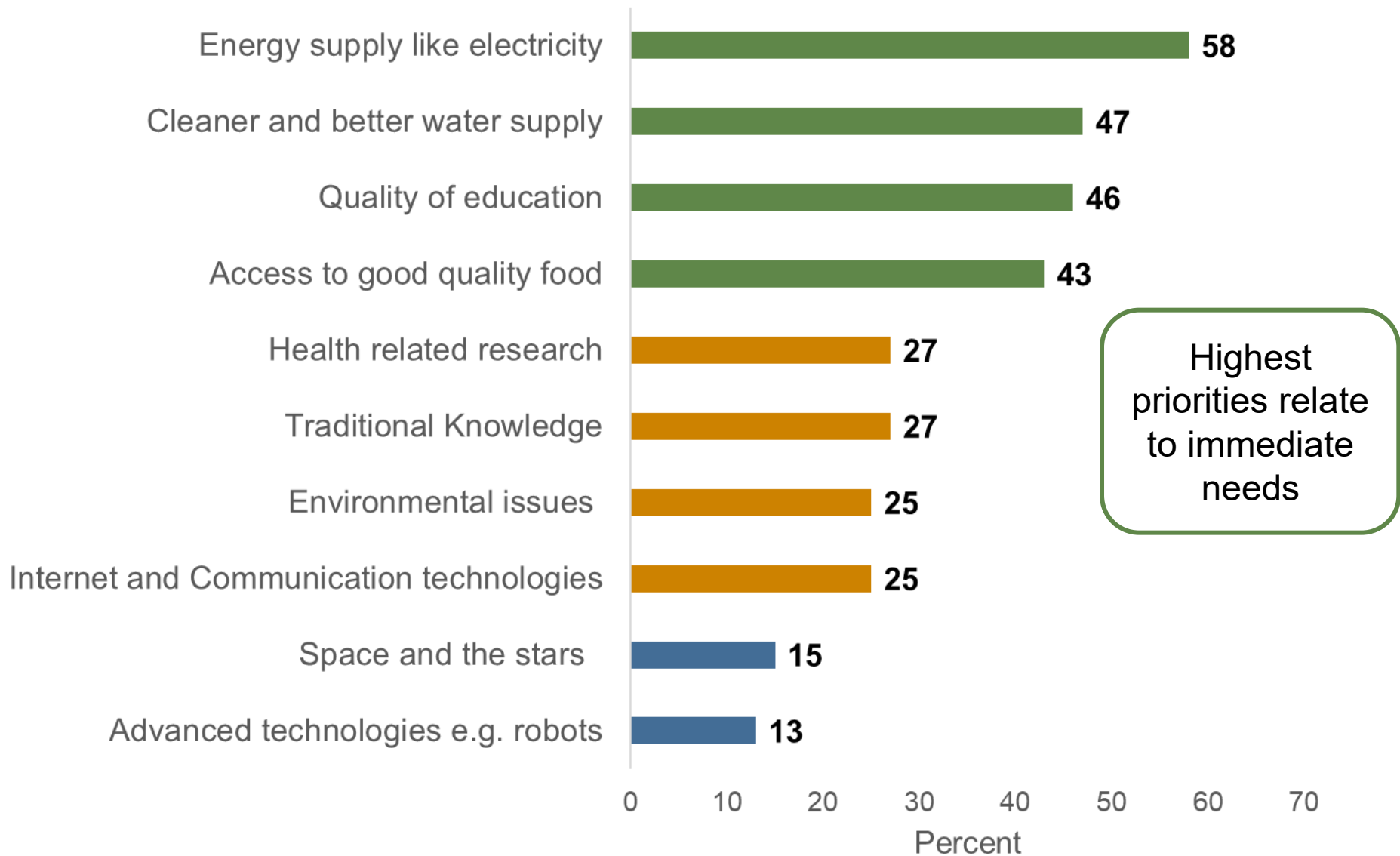
Health technologies



22%

Online learning courses

Priorities for future funding



Socio-demographic characteristics

- Various characteristics related to S&T knowledge, attitudes and engagement

Greater knowledge and interest

- Higher educational attainment
- Higher SES
- Employed
- Younger
- Urban formal

More positive attitudes

- Higher educational attainment
- Higher SES
- Employed
- Younger
- Urban formal

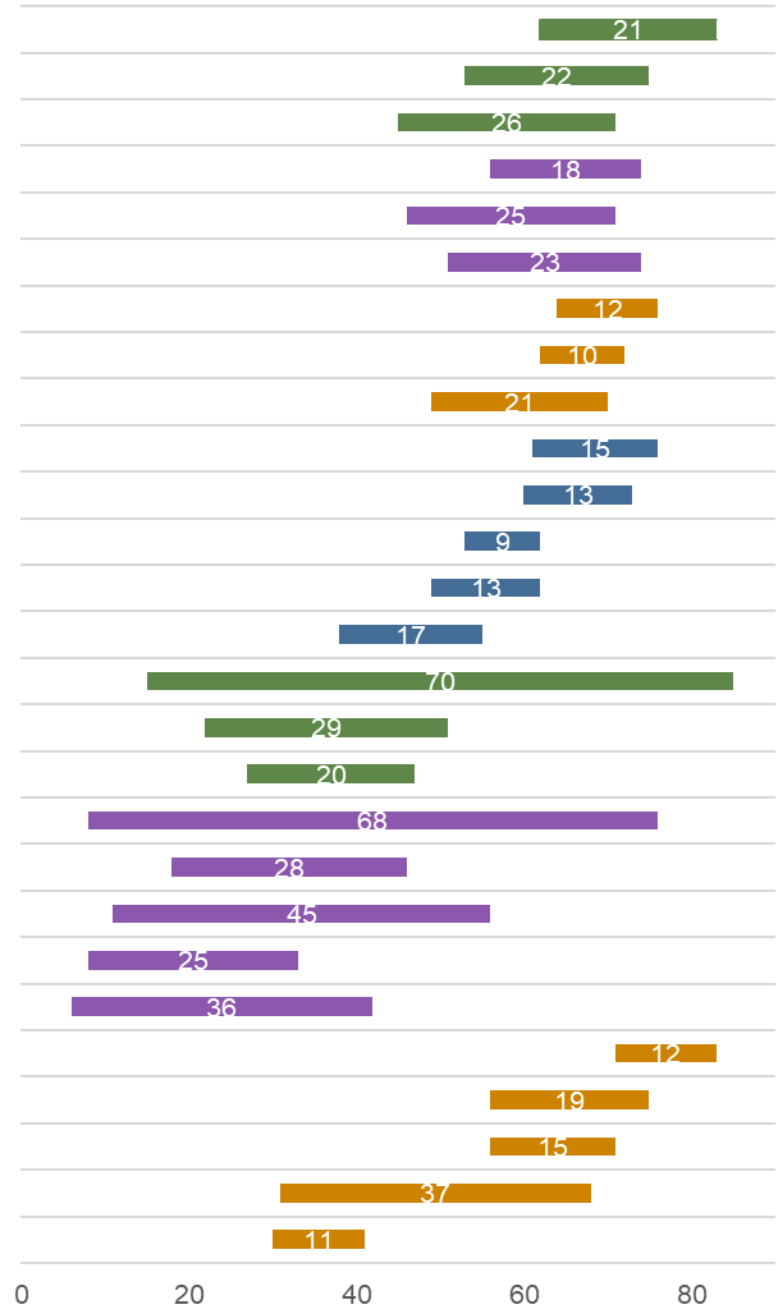
Greater engagement

- Higher educational attainment
- Higher SES
- Employed
- Younger
- Urban formal

Overall patterns

SAPRS fingerprint

Indicator	Sub-Indicator measures	Average Score
Interest	Environmental concern	72
	Interest in science areas	67
	General interest in S&T	58
Knowledge	Environmental knowledge	67
	Perceived knowledge of science areas	61
	Formal science knowledge	60
Promise & Reservation	Reservation of S&T	69
	Promise of S&T	68
	Promise of traditional S&T	62
Trust	Trust in S&T information from universities	68
	Trust in work of scientists	69
	Transformation of cultures in science organisations	59
	Trust in S&T information sources	58
	Trust in government evidence-based decision making	50
S&T Information	Daily usage of the internet	50
	Exposure to S&T news	42
	Consumption of S&T news	39
Science Engagements	Exposure to STEM subjects	56
	S&T information sharing	37
	Use of online apps	32
	Community-based engagement	23
	Attraction-based event attendance	23
Pride & Promise	Promise of S&T skills for young people	78
	Pride in SA S&T achievement	66
	Valuing S&T experiences	67
	Govt spending on R&D is too low	49
	SA achievement better than rest of world	36



Recommendations for enhancing the SAPRS



1. Science engagement must embrace the science and society paradigm

The science-in-society paradigm recognises the bi-directional and dialogical nature of the relationship between science and the society. This approach should be continued and strengthened.



2. Characterising and describing the South African public

South Africans are thoughtful and aware of S&T. Variations were largely due to differences in educational attainment, socioeconomic status and access to resources, as well as population group and, in some cases, age and geographical location.



3. Improving science knowledge

Higher educational attainment and knowledge were associated with more positive attitudes, access to S&T information and science engagement. Science awareness programmes should be delivered through multiple platforms, highlighting S&T as part of everyday life.



4. Increase interest in S&T and build a society that promotes a science culture

Interest in science was associated with science awareness and knowledge, as well as positive science attitudes and engagements. The scale and reach of present programmes should be expanded to instil a culture of curiosity and inquiry in society.



5. Knowledge of, interest in, and concern about, S&T are strongly interlinked

To raise any one of them will raise the others, irrespective of individual and demographic characteristics. However, a focus on interest may be more amenable for interventions.



6. Home educational interactions and engagements matter

Home support for education was crucial. This highlights the importance of early exposure to, and consumption of, S&T information, and attendance at events that inculcate an appreciation for S&T; as well as intergenerational curiosity and knowledge building.

Recommendations for enhancing the SAPRS



7. Views of promise, pride and trust are egalitarian in character

South Africans tend to adopt a favourable, but not uncritical view of S&T, irrespective of background. We should promote a cultural system that values, celebrates and promotes S&T; and showcases evidence-based decision-making processes, debates, critique and contestation of ideas.



8. Levels of science knowledge and access to S&T information are diverse in character

Patterns of science knowledge and interest, as well as access, exposure to, and consumption of, S&T information are diverse. We recommend continued supplementary tuition and public science awareness programmes to enhance knowledge and interest, as well as zero rating of S&T educational sites, and the creation of content that is relevant to different life experiences.



9. Increase access to S&T information

The public trusts S&T news on television and radio but are cautious about news on social media. S&T information should be communicated in easily understandable ways on television and radio, and an awareness of the rich information that can be found on the internet should be encouraged.



10. Promote science engagement

Generally, low engagement levels were observed, with the lowest for attraction based events. Campaigns to promote information, interest and knowledge, combined with efforts to promote greater access to S&T sites and events, should have a positive effect on science engagement.



11. Educate the public about the value of traditional S&T

While the South African public reported moderate awareness of traditional S&T, there is a need for a continued concerted effort to communicate, inform, educate, celebrate and create awareness about this rich field of S&T.

What would an engaged South African public look like?

- Scientifically literate and critically-minded**, able to **understand** and **evaluate** scientific information in daily lives:
- i. Aware, informed and discerning:** People would be informed, critical and discerning consumers of S&T information.
 - ii. Interested and curious:** People would seek opportunities to learn more and engage with S&T.
 - iii. Actively involved:** Public actively engaging with S&T relevant to their culture and daily lives.
 - iv. High trust in institutions:** Trust in scientific institutions and expertise, transparency and communication.
 - v. Holistic knowledge recognition:** Recognise the value of indigenous/traditional knowledge.

Methodological considerations

- 2022 survey serves as a baseline
 - 2027 will focus on changes from 2022
- Revision of survey instrument based on the effectiveness, usefulness and accessibility of items
- Subsequent surveys administered to a sample size of 3500 respondents
- All measures should be created from multi-item indices
- Analyses will include descriptive and inferential statistics
- Consider how science engagement is measured
- Popularisation

SAPRS Reflection Conference



SAPRS Conference resolutions

1. Programme revision

- Revise the implementation plan for Science Engagement based on conference insights

2. Inter-governmental co-ordination

- Build communication with other government departments
- Establish an inter-governmental forum on science engagement
- Create an Inter-Ministerial Committee for cohesive STI efforts

3. Strategic integration

- Place STI at the centre of industry, government, education and society under the new Medium-Term Development Plan

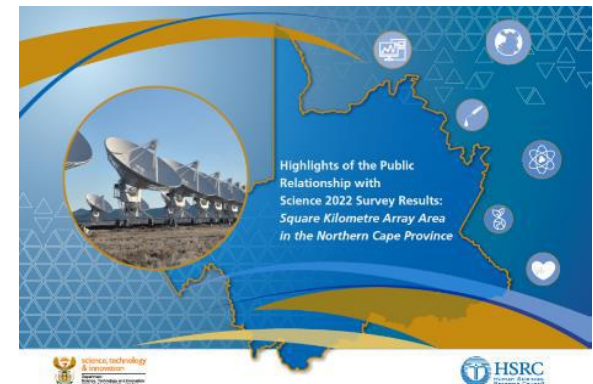
SAPRS Conference resolutions

- Develop targeted **educational programmes** in both **formal and informal learning contexts**
- **Strengthen collaboration** across sectors to promote **science literacy**
- Implement “**science for society**” approaches through **inclusive**, activities that make science **relevant to diverse communities**
- Promote **cross-generational collaboration** to preserve and transmit IKS
- **Leverage** science spaces and research institutions as trusted intermediaries and **anchors of public engagement**
- Support **community-led initiatives** to build grassroots **trust** in science in local languages


Conclusion

- In 2022, the South African public:
 - Had some knowledge of S&T
 - Were curious about S&T
 - Recognised the benefits (promise) and risks (reservation) associated with S&T
 - Were not meaningfully engaged in S&T activities (e.g. access, resources, location)
- Responsibility for promoting S&T knowledge, attitudes and engagement rests with all S&T stakeholders
 - Greater promotion of S&T awareness and interest, better use of S&T infrastructure, enhanced access to S&T opportunities and information

Reports



HSRC Review and opinion pieces



How South Africans see science: key findings

A strong relationship between science and society ensures that people are informed about how science and technology can address development challenges. It also enables greater public participation in shaping science policies and priorities. For this HSRC study, researchers used seven indicators and 27 measures to describe the relationship between science and society. This is the first of three articles that present results from the South African Public Relationship with Science 2022 Survey.

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Support or scepticism? Trends in South Africans' attitudes towards science and technology

South Africans have a somewhat complex relationship with science and technology, vacillating between attitudes of promise (benefits) and reservation (concern). Although there is considerable optimism about the potential benefits of science and technology, a notable portion of the population maintains its reservations. Exploring citizens' attitudes towards science and technology, this is one of three articles in the June edition of the HSRC Review that draws on data from the HSRC's 2022 South African Public Relationship with Science Survey.

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Understanding science and technology: views from the South African Public

Science and technology influence and shape numerous aspects of our daily lives in various ways. Understanding this empowers people to make more informed personal and societal decisions, promotes more economic opportunities, facilitates the effective use of digital technologies and adaptation to new innovations, and encourages more meaningful participation in related decision-making processes. Examining South Africans' understanding of "science" and "technology", this is one of three articles in the June edition of the HSRC Review that draws on data from the HSRC's 2022 South African Public Relationship with Science Survey.

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Women's Month project Spotlight: South African Public Relationship with Science Survey

WOMEN'S MONTH

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Infographics

South African Women's Engagement with Science and Technology

The 2022 South African Public Relationship with Science (SAPRS) Survey explored the public's science engagement activities and behaviours. Here we present women's attendance at science and technology (S&T) sites and activities as an index on a 0-100 scale, where higher values illustrate greater attendance.



Snapshot of the 2022 South African Public Relationship with Science Survey

Science helps us understand the world, ourselves, and the challenges we face. Beyond its economic and technological benefits, science plays a vital role in addressing global and local issues that impact our lives.

Since 1994, South Africa has recognized the importance of investing all citizens in shaping the National System of Innovation (NSI). The Department of Science, Technology and Innovation (DSTI) leads efforts to promote public engagement with science and build a science-friendly society. Key policies like the White Paper on Science, Technology, and Innovation (2015) and the Science Engagement Strategy (2015) guide these efforts. To track progress, indicators were developed to measure science engagement and the South African Public Relationship with Science Survey was developed to assess public knowledge, attitudes, and engagement in relation to science and technology.

In 2022, the first national survey provided a basis for developing indicators to enhance the connection between science and society. The survey will be conducted every five years, with the next one planned for 2027. Two reports have been produced on the 2022 results and can be referred to for more information:

- Department of Science and Innovation (2024). The South African Public Relationship with Science 2022 Survey Results. Prepared by the Human Sciences Research Council for the Department of Science and Innovation, Pretoria.
- Department of Science and Innovation (2024). Highlights of the South African Public Relationship with Science 2022 Survey Results. Prepared by the Human Sciences Research Council for the Department of Science and Innovation, Pretoria.



The Science Engagement Monitoring and Evaluation Impact Indicator Framework

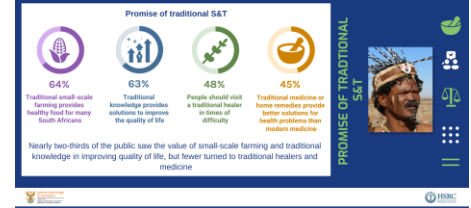
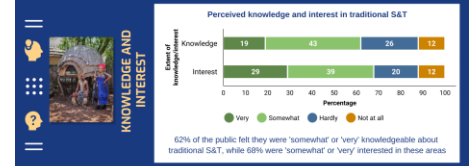
The SEMEF was slightly adjusted to encompass seven indicators or impact themes and 27 sub-indicators or impact measures. These indicators included science and technology (S&T) knowledge and interest, attitudes of promise and innovation, trust, S&T information, and science engagement sub-items, including sentiments of pride and the perceived promise of S&T. To define and implement each indicator or impact theme, three to five impact measures were identified.



OUR KNOWLEDGE. OUR STORIES. SOUTH AFRICANS' CONNECTION WITH TRADITIONAL SCIENCE AND TECHNOLOGY

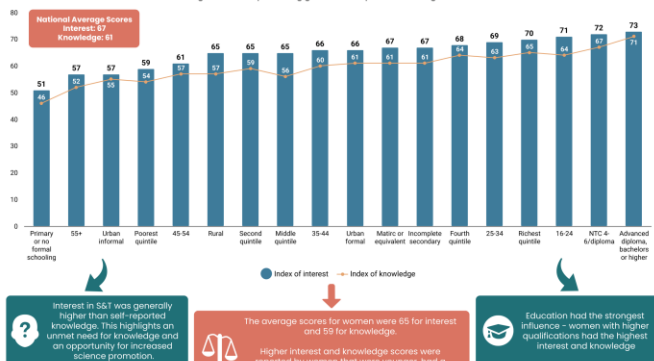
Knowledge takes many forms. While modern science relies on analytical and reductionist methods, traditional knowledge emphasises intuition and holistic understanding. Both of these forms of knowledge are vital and worth promoting.

By traditional knowledge, we mean local knowledge that is unique to a given culture or society and usually passed from generation to generation. It is also referred to as indigenous knowledge.



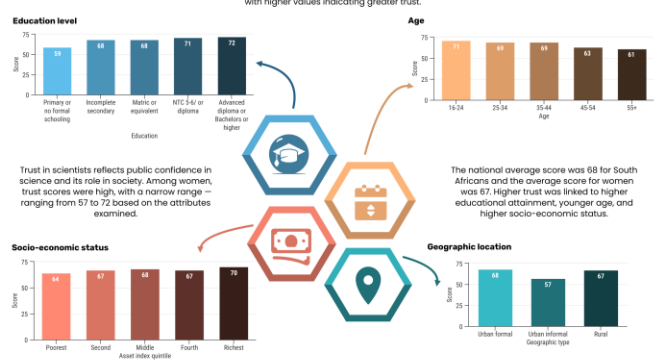
South African Women's Knowledge and Interest in Science and Technology

The 2022 South African Public Relationship with Science (SAPRS) Survey explored public knowledge and interest in various areas of science and technology (S&T), which is key to driving engagement and awareness. Here we present women's knowledge of, and interest in S&T areas as indices on a 0-100 scale, with higher values representing greater self-reported knowledge and interest.



Women's Trust in the Work of Scientists in South Africa

The 2022 South African Public Relationship with Science (SAPRS) Survey examined public attitudes towards several science and technology (S&T) related aspects, including trust in the work of scientists. Here we report on differences in patterns of trust among women, based on an index scaled from 0-100, with higher values indicating greater trust.



SAPRS webpage

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