

Reflections on statistical leadership: Summary of a panel discussion at the WSC 2023¹

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Abstract. What qualities are needed by statisticians to achieve top leadership positions in academia, business, industry and government? Five leaders from statistical societies, national and international statistical offices, and academia share their experiences. They respond to five specific questions. Firstly, is leadership just needed by top management or do all statisticians have a role? If so, what is it? Secondly, do statisticians naturally make good leaders? What new skills do they need to acquire? What skills advantages do they have? Thirdly, the panel consider the question: did you work for people who were not good leaders? How did they fall short? What good role models did panellists have? And then, is it harder for women, and for other under-represented groups?

And finally they were asked: what message do you have for young statisticians aspiring to leadership roles?

What do we mean by statistical leadership? Panellists draw on their own experience and leadership journey.

Stephen Penneck

Let's start by defining the term. Statistical leadership suggests two components. Statistics is a profession. It has a set of knowledge and skills, and a set of values. We learn the knowledge through study, and skills through practice and experience. Knowledge and skills

are needed to collect and summarise data to provide insight, which is what statisticians do.

We probably absorb values from more experienced colleagues, from experience of particular issues and from seeing them written down in policy statements. A statistician's values are based on integrity, trust and objectivity, and are often set down in Codes of Practice. See for example, ISI's shared professional values (<https://www.isi-web.org/our-values>). To be a member of ISI you have to subscribe to three values: respect, professionalism, and truthfulness and integrity.

By respect, we mean respecting the privacy of others and the promises of confidentiality given to them. Professionalism means acting with responsibility, competence, expertise and judgement – understanding user needs, using fit for purpose methods, committing to continuous learning, etc. Truthfulness and Integrity means producing results using our science and not be-

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ing influenced by funders or politicians, objectivity and transparency in all that we do which effectively means independence in function.

So the ‘statistical’ part of leadership should be clear. But what do we mean by leadership? It’s an important question to ask at the beginning because leadership and management often get intertwined and confused. And, of course, senior professionals need to be able to both lead and manage.

Leading is about setting a clear direction – having a vision and communicating it. It means getting people to follow you – by inspiring them, convincing them of its necessity and benefits, but also supporting them on the journey towards it. Not just the people who work for you, but also key stakeholders – your customers and funders. The vision needs to be articulated so that stakeholders can see its benefits. Those who will help deliver it need to be helped to identify and overcome hurdles. They need to know what it means for them. To be a leader you need to have followers. The vision may advance strategic solutions for an organisation as a whole which may be sub-optimal for some parts of it. So there needs to be an understanding of the wider benefits. All of this requires a leader to have excellent communication skills. Leaders work through a strategic plan, which articulates their vision and sets out the priorities and the objectives needed to achieve it.

Managing is about marshalling and deploying resources, which might be budgets or people. A manager allocates resources in the best way to meet objectives, and monitors progress towards goals. A manager will work within the framework set down in the strategic plan, developing and delivering those objectives.

It is said that management is about getting work done well, while leadership is about getting the right work done and work done better.

Most senior people are both leaders and managers, but it is helpful for them to understand the difference – leadership often gets crowded out by management.

John Bailer

A professor told me (during undergraduate study): join the American Statistical Association (ASA). Since I was very involved in biostat-related work, I later joined the International Biometric Society (Eastern North American Region). Because of being involved with risk and environmental toxicology work, I joined the Society for Risk Analysis and the Society of Environmental Toxicology and Chemistry. With international and broader scientific interests reflected in later affiliations, I joined ISI and the American Association

for the Advancement of Science. What was the Inspiration to join these organizations? Community, connection, networking.

Leadership in general, and statistical leadership in particular, involves a variety of dimensions. These include facilitating the development of a *vision* for a department, institution, profession; developing and promoting *strategic goals*; identifying with team *tactics* to achieve goals; *communicating* the organization’s vision; nurturing *community*; and *mentoring* junior colleagues.

At a seminar many years ago, I recall Parker Palmer saying that the purpose of teaching is to create a space where students can learn. A modification that might apply to statistical leadership is that the purpose of statistical leadership is to create a space where professionals can flourish and an organization can thrive.

Ed Humpherson

A few years ago, the Office for Statistics Regulation undertook an exercise to review the UK’s Code of Practice for Statistics. As part of this we ran some focus group sessions with teams of statisticians across the UK. At each focus group, we asked individuals to think of a statistician that they admired, and to write down the qualities that that person possessed. It could be a colleague, a senior leader, a teacher... we set no boundaries. All we wanted was to generate a list of good qualities of statisticians. We then used this list as a test bed for the Code of Practice. How far did these qualities feature in our Code?

I expected features like technical competence, or knowledge, or innovation in methods, to feature in our list.

In fact, time and again, we got things like the ability to explain; to make the complicated simple; and to make statistics exciting.

These themes have been prominent throughout the sessions I’ve been to at this year’s World Statistics Congress. I would add one further characteristic that has featured prominently in this year’s sessions: the willingness to stand up for the appropriate interpretation of statistics, and to resist the perceived tidal wave of misinformation that (people fear) threatens to overwhelm us.

How does this relate to statistical leadership?

Well, it would be possible to give an account of leadership that captures a general list of leadership attributes: vision, strategy, stakeholder management, staff engagement and empowerment. These are of course all very important.

However, I want to identify something essentially statistical – some qualities that only statistical leaders

need to exemplify; something that goes beyond a more general list of leadership attributes.

Building on my exercise to identify the qualities in admired statisticians, and the latent themes of this year's Congress, I'd identify two essential features of statisticians who are leaders.

Firstly, the ability to communicate statistics, including explaining complicated concepts and conveying uncertainty. Perhaps this might be better explained as the ability to energise people about statistics. And secondly, the ability to protect statistics and statisticians in a world that appears increasingly prone to misuse and misinformation.

Mariana Kotzeva

The topic of statistical leadership is gaining importance in today's world of explosion of information that appears increasingly prone to fake news and disinformation. It is also high on the agenda of Eurostat and National Statistical Institutes (NSIs) in the European Statistical System (ESS). My contribution is inspired by and leverages the discussions held by the Presidents and Director Generals of NSIs in the ESS organised by Statistics Sweden and Eurostat on 12 and 13 April 2023 in Stockholm.

Statistical leadership has both external and internal dimensions for statistical offices. External statistical leadership can be defined as capacity to maximise the impact and influence the others to use data and statistics for public good through building relationships and networking, not through hierarchy. Statistical leadership could also be considered in a narrower sense, inside statistical organisations. In that sense the capacity to lead a statistical organisation is differentiated from the capacity to manage statistical organisation. It is worth recalling here the statement that whereas management means making others do what you want leadership is about making others want what you want.

The external dimension of statistical leadership involves statistical leaders acting as champions for the use and value of official statistics. A statistical leader interacts and builds strategic relationships and networks. He/she engages with users to gain a deeper understanding of their information needs as well as to navigate them through both the advantages of data and their constraints in informing certain situations and trends. A statistical leader can communicate clearly complex concepts and reduce uncertainties as well as energise the audience and getting it excited about official statistics and data.

Statistical leadership can help to ensure that right (relevant and needed) data and statistical insights are

available at the right time to inform decisions, and that they are communicated clearly in the way that supports confidence in them and in the decisions based on them. Successful statistical leadership increases visibility of NSIs. It can contribute to ensuring funding of innovative projects and attracting staff with the right skills and motivation. Finally statistical leadership can contribute to maintaining the trust in official statistics and its products that is essential in emerging data ecosystems with multiple players.

Statistical leadership is absolutely needed for the top management of statistical organisations. It is not confined to them though. Every NSI employee can be a champion of official statistics and can exert statistical leadership. This in turn requires training and capacity-building inside statistical organisations starting with managers, methodologists and subject matter experts.

Denise Silva

I have been involved with statistics since I was 15 years old. My mother was a nurse and was the first person to tell me about Florence Nightingale. When I was about to start high school, she recommended the vocational-technical school on statistics maintained by the Brazilian National Statistical Office, named IBGE, since I always expressed my interest in quantitative disciplines. So, in 1978, I started a 3-year vocational-technical course in Statistics at the National School of Statistical Sciences. I continued my studies to become a Bachelor in Statistics, that was followed by postgraduate degrees also in Statistics.

Almost my entire professional life has been dedicated to official statistics, research, and teaching. I started my career as a Bachelor of Statistics very young, at the age of 22. I felt a sense of victory for what I had achieved and a fear that my knowledge was not enough for the challenges of the profession.

This mix drove me forward, keeping my focus on varied capacity building opportunities in graduate school, in my day-to-day work, and in partnerships with people who were more professionally experienced than me.

So, my first point is that statistical leadership comprises both statistical knowledge and statistical expertise. Within statistical expertise, I include: to be able to look forward, identifying statistical challenges, contributing to the solution of technical problems, and making the solution useful and understandable by multi-disciplinary stakeholders. Helping others to understand proposed statistical solutions and clear communication, as was also highlighted by other panel members.

In addition, within the scope of statistical expertise, I understand that our profession is developing and mod-

ernizing every day and that we must all follow the path of continuous learning. Then, statistical leadership is also to support your colleagues in this continuing learning path, besides being an example of a long-life learner.

I have been participating in professional activities in different continents and engaged in national and international statistical societies. Hence, ISI and ISI associations are relevant since they played a vital role for my professional development as an open window to the international statistical scenery and a pathway to the world. Based on this experience, I believe that statistical leadership also plays a role in supporting our communities to be part of this invaluable environment.

A good professional career is made of effort and dedication, but also of generosity. The same is valid for statistical leadership. It is to teach others what you know, and always ask what you don't know.

Discussing and agreeing on what to do, and how to do it, is not an easy task. To figure out a negotiated solution requires more effort than to dictate one.

We should not dissociate the good professional or leader from the good person that we can always be. People recognize good team players and I believe that statistical leadership is not only related to technical skills but also to social-emotional ones.

During the session, other abilities were highlighted: risk management, ability to deal with different cultural environments, respect diversity and understand its value, be a good listener and a role model, as well as take responsibility.

Is leadership just needed by top management or do all statisticians have a role? If so what is it?

Ed Humpherson

The qualities of statistical leadership that I have identified – communicating and energising; and standing up for statistics and statisticians – are clearly required by top management in statistical and analytical organisations. But they are not confined to those top echelons. They can be demonstrated by people throughout an organisational hierarchy; by people at all stages of their career; and by people who have small teams and people with responsibilities for large organisations.

Everyone can learn how to communicate and energise. Everyone can stand up for statistics and statisticians.

If you develop these attributes early in your career, you can supplement them with the more generic leadership skills as your career advances. But if you reach

a senior role without them, you may be a good strategic or a good organiser, or indeed even a good generic leader. But you will not be a statistical leader.

John Bailer

Outlined in the introduction of this article were the tasks for Leaders, Managers, and Administrators. One framing is that administrative, managerial and leadership skills are needed in varying degrees by statisticians.

Skill needed	Group
Personal project	ALL statisticians
Administration/	
Mgmt. skills	
Administrator skills	ALL statisticians (after initial new staff period 5–6 years)
Manager skills	ALL project/research team leading statisticians
Leadership skills	Project/research team leaders who are given responsibility for more complex units involving multiple projects/teams

Bottom line: administrative and management skills are needed by all. Leadership skills are needed when more responsibility is assumed.

Do statisticians naturally make good leaders? What new skills do they need to acquire? What skills advantages do they have?

Stephen Penneck

There is evidence that statistical professionals generally struggle in leadership roles. And often they do not seek them. Statisticians often feel that a promotion will take them further away from the job they love and leave them in a managerial job with little statistical content. At the same time, they may put little value on acquiring leadership skills.

Statisticians have some natural leadership advantages. They are able to process large amounts of information and have well developed problem solving and critical thinking abilities. These are important leadership qualities. Similarly, statisticians usually have a well-developed sense of integrity.

Statisticians tend to enjoy solving complex problems, but this can involve an excessive involvement in detail rather than taking a strategic view. Also, they sometimes may have a view that the analysis of a problem shows an inevitably 'right' answer, and can be unsympathetic to those who do not follow the logic. Their work experience may not help them to develop the strong communication and negotiation skills that leaders need. Expertise

within a specialist area, whether it is national accounts, demography or environmental statistics brings recognition among your peers, with papers applauded in conferences and in journals. This can be a very rewarding aspect of a statistician's work.

But by focusing on, being expert in and being very loyal to their own work area, statisticians can lack a broader organisational focus. They can fail to 'see the wood for the trees', and as a result not make the contribution to the organisational goals that they might.

Leaders need to be comfortable with uncertainty, take calculated risks, and be prepared to fail. Statisticians are experts in uncertainty but can be more comfortable when decisions flow from analysis, and can be slow to take decisions.

Statisticians have a good understanding of risk, but can often be thought to be over-cautious, arguing why things should not happen, while other professions may take a more positive or flexible approach. This can lead to statistical advice being side lined.

Good statistical leadership is about having good emotional intelligence. It's about having a good understanding of yourself, and what you do well and what comes naturally and what skills you have to work on. For most statisticians in government, it's about connecting with customers. For top level management it may be about listening and negotiating.

So, is it that statisticians aren't born with the necessary leadership skills or that they do not develop them?

It may be that statistics attracts certain types of personality ('backroom' people) but also maybe the practice of the profession does not naturally develop leadership skills.

To become leaders, statisticians need to see how they can contribute to their organisation's higher goals. They need to develop self-awareness; understand their own leadership style and how they might need to change. They need to demonstrate good listening skills and demonstrate empathy. They need to be pragmatic, addressing and anticipating the needs of decision-makers while retaining their professional integrity. Leading change is an important leadership role, and emotional intelligence is needed to understand why colleagues might feel uncomfortable about how the change impacts on them.

Statisticians have a unique perspective on problems, they have insights based on their skills and experience of analysing data and are in a good position to use these insights to add value. Adding broader leadership skills to this skill set can turn them into powerful leaders.

Denise Silva

Do statisticians naturally make good leaders? Unfortunately, not. They (we) are not taught to do so during their (our) academic degrees. It's almost like that we are trained to work backstage.

What new skills do they need to acquire? What skills advantages do they have? Statisticians have competence to examine the problem as whole but need to improve other skills such as: communication, language proficiency (especially in English, to be able to liaise with international colleagues and to take part in international activities), and ability to communicate complexity (this was also highlighted by other panel colleagues).

John Bailer

Granted that we have a biased perspective, we believe that statisticians possess a skills advantage similar to scientists in general. Formulating problems and considering the data needed to address problems is part of their education. Strategic thinking also tends to resonate with statisticians.

What new skills do they need to acquire?

A successful leader will need to possess the following skills to be successful: listening; communication – written + spoken for non-technical & technical audiences; project management; and mentoring.

Do statisticians naturally make good leaders? Not all will but why would anyone expect this? Are all statisticians good consultants? Teachers? Researchers? – No! Don't expect leadership to differ. Fortunately, many of the leadership skills can be learned but whether someone will be successful as a leader will reflect an ability to inspire others.

Did you work for people who were not good leaders? How did they fall short? What good role models did panellists have?

Mariana Kotzeva

In my already 30 years long experience in statistics I have met many statistical managers and leaders. I had the privilege to meet and be inspired by indeed good leaders and good role models. I also had the chance to encounter with not so good ones. I can summarise my experience as follows:

The leaders who have inspired me were not afraid of standing up for official statistics. They used every opportunity to promote its value. They proactively searched for dialogue with users, especially institutional ones, to understand their information needs but also to

explain, to promote how high-quality numbers, comparable across countries and over time, contribute to making informed decisions for the public good and to fighting against disinformation. My role models were excellent communicators, blessed with the capacity and charisma to engage people, to explain complex methodologies in a simple way, using stories and examples. They constantly anticipated trends and new demands and strived for innovation in the organisations they led. Inside statistical organisations, good leaders who have inspired me were high motivators, engaging their teams for transformations and improvements even in difficult times, led always by the perspective of meeting user needs and providing better data for better lives. They were competent and interested in any field of statistics.

These leaders who did not inspire me were missing the qualities mentioned above. With such people at the top, statistical organisations have simply missed opportunities to become even more relevant and gain more trust as providers of high-quality statistics and data on societies and economies.

Ed Humpherson

I am going to pick two bad and two good role models.

The first bad role model is a senior leader who was always the cleverest person in the room. This person had to lead the conversation, had to display superior knowledge, have the main and last word on any topic. The effect of this behaviour was to leave others, including me, feeling diminished and unnecessary. After a while, it meant that you stopped bringing your best to a debate or a discussion, because you knew it will be undermined. This created a very negative atmosphere.

The second bad role model displayed a surplus of caution. On any proposal, on any topic, the default question was “have we thought through the risks?”, followed by “do we know what XYZ important stakeholder is likely to say about it”. In isolation this is quite a good method – it ensures that bad proposals get tested. But in aggregate, the effect was deadening. It became inhibiting, because it never conveyed the higher level goals that we were aiming to achieve.

Contrast this with my two good role models. The first was a colleague who always made sure everyone contributed to a discussion. This leader made people want to contribute, and always used people’s comments as a building block, not a wrecking ball. As a result, meetings were always energetic – and fun! And this leader always shared out the credit. For example, when I proposed something which was not a great idea, the leader took my idea, developed it, improved it, and

made it into something good – but always let me, as the most junior person, get the credit for it. It made me feel more confident – well, bigger, really.

The second is someone who is quite well known, so I’ll name her: it’s the philosopher Onora O’Neill, whose work on trustworthiness blew my mind when I first encountered it. It became the defining philosophy of the UK’s Code of Practice for Statistics, and the first pillar of this Code is called Trustworthiness (the others are Quality and Value). Why is this an example of leadership? It’s because here is an individual who, through the alchemical power of her thought, enabled lots of people to look at things in a new and better way. It’s energising (in the sense I described above) and transformational. When considering leadership, who could ask for more than this capacity to lead thinking?

Is it harder for women? And for other under-represented groups?

Denise Silva

I believe it was and it remains like that. For some people, the pathway to reach posts and opportunities is longer, tortuous and difficult. Ethnic, gender and sexual issues, as well as socioeconomic background are intrinsically related with personal experiences in the labour market, for example (even when people reach the same academic degree).

As leaders, we can act to alleviate such difficulties, based on our personal experiences, and successes, by supporting the professional development of people whose opportunities have been limited.

Mariana Kotzeva

It seems that I am well positioned to answer this question being the first woman at the helm of the Bulgarian National Statistical Institute in its 130 years of history and of Eurostat in its 65 years of history. I would say it was considered unusual bearing in mind the long history of only men occupying these positions. I needed to prove during the selection process in both cases that I met all the criteria and had the knowledge, skills, and motivation to lead the organisation and my gender and nationality should not be a factor influencing the decision.

The biggest battle is inside us – to remain motivated and not give up hiding comfortably behind the fact that no other woman had succeeded before me. It has also been important to find and maintain the balance between professional and family life.

Throughout years of occupying management posts have become fully convinced that diversity and inclusion are key factors for the successful performance of organisations and even more important for bringing in innovation and creativity.

What message do the panellists have for young statisticians aspiring to leadership roles?

Stephen Penneck

We are not born with statistical leadership skills; they have to be learnt. Finding a good role model is a useful start.

John Bailer

Young statisticians need to be open to opportunities to contribute in a leadership role in their institution and local/regional society. They will want to learn about strategic planning ideas (e.g., SMART goals and more), take opportunities to learn about project management ideas (e.g. AGILE project management). And also watch and learn from managers who you think are particularly effective AND from others who are not!

Mariana Kotzeva

Official statistics is a public good. It is exciting and rewarding to know that through your work you can contribute to making better decisions for a better planet and better lives. It is also true that enormous efforts are needed every day to promote the value of official statistics and their use.

My key message is that every one of you can act as a champion of official statistics regardless of the function and the task you are currently performing – methodologist, subject matter expert or middle manager. To become statistical leaders, alongside statistical and data

science specific skills, you must learn how to impact people's minds and steer them towards using statistics and data, correctly and widely. You also must learn how to understand user needs and hold dialogues, and how to improve data literacy.

The good news is that it is a journey and throughout all professional career you will continue learning and discovering new challenges and new tips of how to exercise statistical leadership. So, it will be an exciting and never ending journey, just embark on it.

Denise Silva

To become a statistical leader, and act as one, is to experience a continuous learning process. This includes the broad importance of statistics and how to communicate it. Teamwork skills, being able to express your views, and to contribute to problem-solving, always carefully considering divergent proposals is also important. As is time management, identifying which activities and projects are most relevant on each occasion (recognizing that not everything that seems urgent is actually important). And finally I would stress the importance of generosity of knowledge and its value, fostering fruitful knowledge-sharing and partnerships to achieve meaningful solutions. Young statisticians should also seize opportunities to develop their skills by joining working groups, as well as national and international professional associations/societies.

Ed Humpherson

Don't be guided by what other people tell you is good for your career. Be guided by what you love – what you love to focus on in terms of statistics, and what you love to share with others about statistics. Then your enthusiasm will shine out of you and others will naturally be drawn to it.