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Expert Discussion

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Pragmatic Solutions to Reduce Global Stroke Burden: World Stroke Organization – Lancet Neurology Commission Report

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The 15th World Stroke Congress (WSC 2023) held in Toronto, Canada on October 10-12, 2023, was one of the largest gatherings of the international stroke community worldwide. The Congress hosted over 3,000 attendees, including clinicians, researchers, and students from across the globe. The joint session on the World Stroke Organisation (WSO)-Lancet Neurology Commission on Stroke saw the key contributors of the Lancet Neurology Commission present recommendations to reduce the burden of stroke across four pillars: surveillance, prevention, acute care, and rehabilitation. The key findings of the report were that by 2050, there is expected to be a 50% increase in global stroke deaths and a 30% increase in stroke-associated disability. To address these, the Commission's expert collaborators from around the globe have offered pragmatic and implementable guidelines.

The first steps of the Lancet Commission were initiated about 7 years ago by Professors Mayowa Owolabi, Walter Johnson, Valery Feigin, Bo Norrving, and Sheila Martins. These have since culminated in a substantive guidelines document, released in October 2023 as a Lancet Commissioned Report [1] outlining not only the projected enormous burden of stroke into 2050, but pragmatic solutions and implementation plans to help mitigate this.

We present here the views and thoughts of some of the experts who contributed to pragmatic solutions to tackle the burden of stroke across those four pillars. This exchange is of particular relevance to neurologists working on stroke for gaining in-depth insight into the work behind this report and to emphasize the importance of this document for ALL those clinicians, health providers, policy makers, and researchers working to combat the rising burden of stroke. Questions and answers by respondent name.

Rita V. Krishnamurthi: How did this all start and what was your role?

Mayowa Owolabi: The idea of the Commission was initiated by Walter Johnson and I when we met in Geneva in May 2016. To sensitise the global

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community to the idea, we published this article https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5034645/. I led the conceptualisation of the methodology. Valery Feigin and I then invited other members of the Commission with relevant expertise to contribute, convened and chaired meetings, provided the initial direction, and coordinated all communications and subsequent writing. I wrote the first complete draft of the Commission; contributed to the design and source materials for the surveillance pillar; co-designed the thematic qualitative analysis of the barriers of and facilitators to care in each section, and the burden projections, prevention, and acute care sections; provided the template for the pragmatic solutions tables for all pillars; drafted the introduction, methods, conclusions and executive summary; led the rehabilitation pillar; and combined, integrated, and revised all sections of the Commission.

Sheila Martins: I participated from the time of the first steps of the Lancet Commission – that is a work of 7 years at least. We started with the global evaluation of stroke services regarding surveillance, prevention, acute care, and rehabilitation to really identify the situation in the world.

Valery Feigin: I was Co-chair of the Commission and was responsible for organizing 2 pillars of the Commission, which were merged into one pillar. The pillars were stroke and epidemiology and prevention, and stroke burden prediction. And my third and most important role was to write the first draft with Professor Mayowa Owolabi. It's a huge amount of work.

Seana Gall: I was originally invited to participate by Professor Amanda Thrift, now retired, who was involved in the project from early on. I was heavily involved in the stroke surveillance component of the Commission, and I also coordinated a qualitative study with stroke experts from 12 different countries around the world to underpin the report.

Bo Norrving: I was with the Lancet commission from the very start and one of those who originally planned the project when it was in the brainstorm stage. It was felt as a very brave thing to do for stroke to come on this level on the Lancet scale, but nevertheless we said, yes, it's worthwhile to do it and to push it.

Jeyaraj Pandian: I've been involved right from the conception, maybe indirectly in the beginning and, when it evolved. In fact, we were planning for a meeting in 2020 in Italy, before the European Stroke Conference, but then the pandemic disrupted the physical meeting. My contribution was in the area of rehabilitation, acute stroke care, and also stroke surveillance.

Rita V. Krishnamurthi: The findings report significant disparities in stroke burden. What are some of the reasons for disparities shown in the report in terms of surveillance, prevention, acute care and rehabilitation?

Seana Gall (surveillance)*:* The ageing of our populations with more people living to the ages where they are at highest risk for stroke will result in a large increase in the absolute numbers of events. But also, many low- and middle-income countries are undergoing an epidemiological transition, moving from communicable diseases to more non-communicable diseases. Also important is that over-nutrition, overweight, and obesity are leading to more hypertension that will also cause an increase in strokes, particularly in low- and middle-income regions.

Valery Feigin (prevention)*:* We found in the survey that those recommendations were mainly developed for high-income countries. In low-middle-income countries, particularly low-income countries, there are often no established national recommendations, diminishing their uptake. This is because cultural issues and local circumstances are not considered. Local stroke experts together with patients' groups, local policy makers need to adapt international recommendations to their local circumstances; resources, ways of communicating with patients, for example, about dietary habits. That was one of the main recommendations of the Commission for secondary stroke prevention.

Bo Norrving: I think the single most important barrier that will influence low- and middle-income countries would be detection and control of hypertension. We saw from the recent WSO report that across all parts of the world, there was a very, very high proportion of uncontrolled hypertension, particularly in lower middle-income countries.

Rita V. Krishnamurthi: How can global communities help support poorly resourced countries to improve their efforts in surveillance of stroke risk factors and stroke, as well as the medical management of these to reduce the burden?

Valery Feigin: That's a very good question and very difficult to answer. I think there is a role for both global and local communities. One of the main problems with implementing primary and secondary stroke prevention recommendations is the lack of funding. There are well-established strategies to reduce exposure to hazards like

unhealthy food, like trans-fat containing food, or food rich in salt, and sugar, sugary drinks, alcohol, smoking, which are still on the rise in many low-income countries. Taxation on these unhealthy products could generate enormous revenue that would be sufficient, not only for prevention of stroke and noncommunicable diseases but also for advancing health services, health workforce development, and overall wellbeing of the individuals.

Sheila Martins: We created a World Stroke Organization global stroke alliance; a partnership between researchers, stroke specialists, health managers, industry, patients' associations, private and public hospitals. The idea is to really put together the implementation plans. . .working with all the stakeholders, discussing directly with the Minister of Health or their representatives in the region to show good examples, to show what should be implemented and to help them create national plans.

Bo Norrving: Definitively, low-income countries cannot make it alone. They need to have money from the outside. You can raise the money by taxation, and then you can use that money for the healthcare system. And in theory, this is good. But in practice, it is hard to tell if the money was placed in the system for the prevention. It is also very important to engage the patients and to engage the general population to improve their health lifestyle, and to be much more aware of stroke risk factors. Each of these is really a key component.

Mayowa Owolabi: The leaders of community-based organisations, faith-based organisations, professional-based organisations, Ministries of Health, health insurers, physicians and therapists and healthcare providers could bring out change. The ecosystem should include the World Health Organisation which can collaborate with implementation partners and Ministries of Health to influence health policy at the country level through policy statements and recommendations, including support for the pragmatic solutions presented in the Commission.

Rita V. Krishnamurthi: What do you think the contribution of surveillance has been towards the improving trends in stroke mortality? Are there any particular insights from your qualitative interviews that you did that you want to share?

Seana Gall: If you have no information about the size of a problem, then there's going to be very little action to address the problem. When we interviewed stroke experts from around the world, we saw that the places where people were collecting this type of data about stroke had much more action. They were using the data to raise awareness about stroke in the community, but also within governments and healthcare systems. There are key types of data on the burden of stroke we need across all populations, like how many hospitalizations, how many deaths, loss of disability-adjusted life years and so on. The interviews also revealed how important it was to build capacity in data collection, analysis, and reporting of stroke data.

Rita V. Krishnamurthi: One of the interesting things that was recommended in low-resource settings was the task shifting from highly trained healthcare professionals to paramedical workers. Have there been any examples where this has been shown to work successfully?

Jeyaraj Pandian: Yes, there are examples. Firstly, in India we have the prevention model using the frontline health workers the Accredited Social Health Activists (ASHAs). These frontline health workers were trained in measuring BP, blood sugar and in lifestyle modifications. In a cluster randomized trial, we were able to show that ASHAs were able to monitor and control blood pressure with the help of medical officers in primary health centres. Secondly, a pilot study using Professor Feigin's DVD on self-management of poststroke care showed good benefit and empowerment for the caregivers, so that they could take care of the relatives.

Thirdly, we carried out a large-scale secondary prevention trial using text messages, videos and a workbook to reduce vascular events (SPRINT India trial) at 1 year. There was an improvement in certain behavioural risk factors such as smoking and alcohol cessation and medication adherence. The intervention package focused on lifestyle modification, monitoring of risk factors, and improving physical activity. The workbook consisted of common traditional games in India that people play. The impact of the intervention would have benefit in the long term.

And then there was digital technology that transferred the measurements and readings to the treating neurologist. And that 2-way communication helped us to monitor their blood pressure, and blood sugar. After 6 months we were able to show that there was a reduction. This is one example of empowerment of the frontline and task shifting.

Mayowa Owolabi: Task shifting and telerehabilitation are solutions which could be explored. There is emerging evidence from India about digital tools including gaming and virtual reality with promising impact in India.

Sheila Martins: The first steps in Brazil happened in 2000. I had the opportunity to show the Minister of Health what we are doing successfully in the country, showing the best models. The Ministry had several concerns such as that it was not possible to treat patients so fast in public hospitals; hospitals are overcrowded (which is true). The medication was too expensive for Brazil, so we showed that we already were working on this, implementing it through care safely and with good results. We demonstrated decreased cost in a cost-effectiveness study.

Rita V. Krishnamurthi: What would you say are the top few research priorities in terms of reducing the burden of stroke, whatever sector or overall, what would you say they would be?

Bo Norrving: One area, I will say, is implementation science; how can we change in the best way the behaviour of the population? We still are not very successful in that field. Then the area of rehabilitation research; how could research be implemented in the lower middle-income countries in other ways than we have now? Another developing field is how much can artificial intelligence be used to help stroke?

Rita V. Krishnamurthi: What actions can be taken to convince policy makers to implement the solutions recommended in the Lancet Commission guidelines?

Mayowa Owolabi: Capacity building should involve training through courses, webinars, exchange programmes, and university degree programmes. Appropriate technologies (devices and tools) manufactured locally from locally sourced materials in collaboration with biomedical engineers will improve accessibility and affordability for stroke rehabilitation.

Bo Norrving: I think this is the lesson learned: that it needs to be multi-sectorial. It needs to be within the profession and the profession must take a leading role. It must be within the political system.

This is the first time that we see the bigger picture of solutions for stroke at the global level and all its different components. We have an enormous potential to make a change to the global burden of disease, by implementing this. We need to engage, we need to be successful in reaching out to the population, to politicians.

Valery Feigin: Pragmatic solutions suggested by the WSO - Lancet Commission for reducing stroke burden were all evidence-based and represent the united voice of experts from around the world, as experts from 80 countries were involved in the development of these recommendations. Policy makers need to realize that and adopt these recommendations to the local conditions. In addition, policy makers must realize that implementation of the recommended solutions is not only medically effective but also cost-effective, saving not only lives but also millions of dollars for their economies, even over a relatively short 2–3 years of wide implementation.

Sheila Martins: The idea of the paper is really to facilitate the guidelines about implementation. We have pragmatic solutions on how to implement every step of acute care. We need to have a guide for health managers (and doctors) to show what should be implemented and to help them create national plans. We have got the possibility of reimbursement for hospitals that are certified by the World Stroke Organization. They are incentivised to improve to receive the stamp of quality, and with this we implement everything that is important to the patient.

Jeyaraj Pandian: This document will be a powerful tool to approach the governments because it is a partnership of Lancet Neurology, WSO and WHO and the member countries. Stroke champions of each country could go through the document and promote implementation. Over the last 6 years, I have been working with WHO Headquarters, WHO SEARO and the WHO country office, developing stroke care services in 11 SEAR countries. Initially, we started the programme in Bhutan, Myanmar, Timor Leste and Maldives. The programme has been successfully implemented in Bhutan and Maldives. We expanding to Sri Lanka and Nepal and hopefully in the coming year Bangladesh and Indonesia. We started with virtual training of doctors, nurses, physiotherapists, occupational therapists, and speach therapists. This top-down approach is used to promote implementation of stroke care services through WHO and Health ministries.

Seana Gall: A key point that was evident through all the interviews with stroke experts, and across each pillar of the report, was the vital importance of universal health coverage. It was also evident that in very low-resource settings, people were doing the best they could with the resources that they had. In some examples there were a handful – one or 2 people – who were experts in stroke care in a whole country that was serving a whole region. These people had made a commitment to helping people that had strokes. That's an enormous burden for these individuals. It was clear that as a global stroke community, we need to build capacity in acute management, but that prevention and rehabilitation also need a lot of investment. There are a lot of gaps in rehabilitation; there tend to be physiotherapists in some countries, not all

countries, but not other allied health specialities. There is no provision of speech pathology or neuropsychology or occupational therapy. There's a need to build capacity to train these specialities to help people get access to the sorts of care that they need.

Rita V. Krishnamurthi: Could you elaborate a little further on how much the quality and quantity of rehabilitation has an impact on functional recovery after stroke, particularly in proportion to the other risk factors that you mentioned? And how can some of these gaps and barriers be overcome in particularly low- and middle-income countries?

Mayowa Owolabi: For rehabilitation to be effective, it must be multidisciplinary. Depending on the range of deficits experienced by the stroke survivor, task-oriented frequent and high-intensity training/therapy (including physiotherapy, speech and language therapy, and cognitive therapy) are effective to improve mobility, hand use, speech, communication, and cognitive function. Frequency of sessions could be hours every day initially and this may be supported by task shifting to caregivers and the patient through self-efficacy and constraint induced therapies.

The major gaps are a lack of multidisciplinary services for stroke rehabilitation due to abysmally low number of therapists and out-of-pocket payments. Training of rehabilitation professionals including neurologists, physiotherapists, speech and language therapists and psychotherapists as well as provision of universal health coverage for stroke survivors will be useful.

Summary and Main Messages

Bo Norrving: I think it's also the first time that we have WSO to take on the lead role like this, in collaboration with UN agencies and with societies, but it is WSO that has the defined role to work for stroke in this area. And I think we are grateful that we have one voice for stroke. We have WSO in place now, with all the collaborations that can start to work with this.

Sheila Martins: I really believe that we can change this global reality working together. We are working with some amazing people from this Lancet Commission. And really, I think we can convince, and we can give tools to the health managers to change this reality. So is a pleasure to work with this amazing group. And thanks a lot to the Lancet Commission for giving us the opportunity to launch this very important document.

Jeyaraj Pandian: My personal experience now is that we need to work with the Government. That is the only way that we can change the policies.

Valery Feigin: Never before have we had so much hard evidence of the ominous perspectives of keeping the status quo in stroke prevention. Never have we had so much hard evidence and tangible, pragmatic solutions for reducing stroke burden. The time to act is now, and we must act urgently by implementing the Lancet Commission recommendations across the globe.

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Author Contributions

Valery L. Feigin, MD: conceptualisation, provision of material, writing - review and editing; Rita V. Krishnamurthi, PhD: investigation, original draft and writing; Seana Gall, PhD, Sheila O. Martins, MD, Bo Norrving, PhD, Jeyaraj D. Pandian, MD, Mayowa O. Owolabi, MD: provision of data, writing - review and editing.

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