Appendix e-1

Dementia in Latin America: Assessing the present and envisioning the future
Mario A Parra, Sandra Baez, Ricardo Francisco Allegri, Ricardo Nitrini, Francisco Lopera, Andrea Slachevsky, Nilton Custodio, David Lira, Olivier Piguet, Fiona Kumfor, David Huepe, Patricia Cogram, Thomas H. Bak, Facundo F. Manes, and Agustin Ibanez

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S1. This Opinion Paper in a Geographical Context

The Latin American region comprises countries with predominant Romance languages. This area (~19.197.000km2, ~ 13% of the Earth's land) runs from Mexico to South America, and includes the Caribbean. The systematic information about dementia is very limited in the region, with many countries not providing enough data to be included in the available international reports. Most of these international reports, including the 10/66 Dementia Research Group (i.e.,[1-5]), the World Alzheimer Report (i.e.,[6-8]), The World Health Organization (i.e.,[9]), or the Global Burden of Disease (i.e.,[10]) considered LAC as a partially unitary region even when official information is obtained from very few countries. We have followed these international conventions, as well as recent approaches to dementia in LAC [11-14]. Further, we have tried to incorporate additional sources from countries not included in international reports, as well as highlighting some important disparities among countries. We have included relevant information from 16 countries (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Jamaica, México, Peru, Uruguay, and Venezuela). Insufficient information was available to comment on 16 other LAC countries (Antigua and Barbuda, Bahamas, Barbados, Belize, Granada, Guyana, Haiti, Honduras, Nicaragua, Panamá, Paraguay, Saint Kitts and Nevis, San Vicente and las Granadinas, Santa Lucía, Suriname, Trinidad and Tobago). Regarding most of English speaking countries in LAC, insufficient or inconsistent findings were available. Consequently, only reports from Jamaica have been included in the present review. This work represents the first attempt to provide a clinical and research overview on dementia related issues in LAC. We envisage that this opinion will help raise awareness and invite more relevant countries to enter this dialogue and join a collaborative framework.

S2. Origin of this Opinion Paper

On November 2015, a group of experts from LAC (Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Mexico, Peru, Uruguay) met at the World congress of Neurology, Santiago, Chile to fulfill an agenda that comprised four main topics on dementia: (1) Diagnosis and early detection, (2) Therapeutic approaches, (3) Social and health support after the diagnosis, (4) Potential avenues for international collaboration. These experts were representative of several LAC, they were invited by MP and IA, and represented around the 50% of the LAC. After a brief introduction, each expert was given a presentation to share their experience and views on each topic. There were four rounds of discussion, one per topic. The discussion was audio recorded and transcribed. These transcriptions led to a series of bullet points corresponding to the core issues identified by the experts. This summary was circulated among the experts to seek agreement, refinement, and further comments on the relevant items. MAP, SB, and AI collated these inputs and put together the first draft of the opinion paper. Some of the experts were invited as co-authors together with other relevant researchers. The first draft was reviewed by each co-author whose inputs were again collated by SB and integrated into the final draft by MAP and AI.

S3. Demographic transition in LAC

Demographic transition in LAC is happening fast. Indeed, the list of 25 countries with the fastest increase in populations aged 65 and over includes seven from LAC (i.e., Brazil, Chile, Colombia, Costa Rica, Guatemala, Mexico, and Peru)[15]. Most of LAC have very young age structures with about half of the population under age 25. This proportion differs to that of East Asia (mostly China) where this proportion is 37 per cent[16]. Fertility rates and their decline is also variable in LAC. In the 1950s, the total fertility rate in most of LAC was high and virtually stable at around six births per woman on average[16]. Some countries, such as Argentina, Chile, and Uruguay, had a relatively low level of fertility by 1970. Conversely, other countries underwent rapid transition of fertility rates over the last forty years [17]. Brazil, Nicaragua and Mexico are among the most prominent. High fertility rates prevail in countries such as Guatemala, Honduras, and Paraguay[17]. Unlike China, in LAC no extreme fertility policies have been implemented. In general, lower fertility rates in this region have been mainly associated with increasing unemployment and adverse economic circumstances, especially among women who are urban and more educated[17].

S4. Collaboration Forum and large-scale computational capacity

A feasible strategy for LAC is to organize meetings in different countries. While national, Pan-American and World Congresses exist, the organization of a LAC Congress on Dementia will increase availability of human resources and training among LAC. Moreover, the Congress would allow dissemination of knowledge, establishment of academic collaborations and creation of harmonization strategies to tackle the dementia challenge, in turn improving comparability of data across LAC. The coordinating country of such a Congress would change every two years and periodic scientific outlets in the region could become important dissemination platforms. A coordination center would be required in the short term to address these outstanding needs.

In addition, the development of large-scale computational capacity will provide platforms for researchers to access tools for patients' assessment. Furthermore, such an online portal would facilitate data sharing across LAC, would enable big data analysis and comparison of results among LAC. For instance, special online platforms supporting clinical and financial database management of research projects have been developed in Colombia, and one ongoing project

is now running in Chile (FONDAP Geroscience project). To our knowledge, no other large-scale platforms are available in LAC.

S5. A Regional/Global Trade-off

Despite the many facets of LAC, many of these countries share high levels of poverty, cultural barriers, and socioeconomic vulnerability, which directly impacts on dementia care and research[11-13]. In addition, instability of governments, poor professional and research training, low social awareness and stigmas, as well as intrinsic differences among countries, seem to be to some extent, dependent on socioeconomic vulnerability. In this context, indiscriminate adoption of gold standard research and clinical/care criteria developed in HIC could result in controversial outcomes. Thus, to avoid any potential negative effects, harmonization must be done while taking into consideration the local context and voices of relevant stakeholders. Confronting the regional dialogue with international standards is critical for developing situationally appropriate harmonized practices (guidelines), consistent with global practices, to address the global challenge of dementia while considering local constraints. By first characterizing the dementia challenge regionally, inaccurate estimations resulting from isolated actions that can lead to inappropriate global extrapolations can be avoided. Urgent changes are required to enable access to health care, which so far has been affected by differences in economic growth, demographic structures, technology, political views, and general health policies[18]. Health inequities within and between countries cannot be addressed in isolation, and require regional/global harmonization considering these various issues[19]. We believe that within LAC, some different intermediate steps are required. In research practice, depending on local and global resources, international guidelines should be followed in order to achieve regional harmonization. However, in clinical practice (and especially care), as well as strategies for patients and family support should be prioritized in LMIC. The use of expensive biomarkers and multimodal diagnosis approaches should be a priority in HIC and UMIC only. This transitional pathway will allow gradual appraisal of clinical and research practices from HIC, and will avoid the potential negative impact of adopting uninformed global strategies without proper contextual preparation and adaptation. Combining local and global monitoring actions along this pathway will be critical for a successful transition towards a global context.

S6. Support after the diagnosis: Unfavorable political environments

Unfavorable political environments[11, 20] (including highly polarized policies, lack of continuity across governments, and perception of politicians as corrupt), prevent smooth communication between national and international organizations and public policy makers. More systematic information is needed to support government agencies in regional decision making and policy benefiting those affected by dementia. Furthermore, governments must urgently work toward closing the gap between the need for prevention, treatment and care of dementia and the actual provision of these services. Regarding National plans, there are some exceptions[14]: Costa Rica (Launched in 2014); Argentina (2016); and Chile (2015, in process).

A recent study[21] shows that direct medical costs (medical care, drugs, tests) increase in higher socioeconomic status, reflecting differences in purchasing power. Conversely, indirect costs (associated with informal care) are inversely related to socioeconomic status. Moreover, in lower socioeconomic status groups, female caregivers, typically family members who are inactive in the labor market, mostly provide informal care. In countries such as Chile, with the largest income inequality between the rich and the poor, and among older adults, 18% are under the poverty and extreme poverty threshold, while in the general population these

percentages are 14.4% and 4.5% respectively[22]. Thus, in LAC socioeconomic status is a determinant of the cost of dementia.

References

1. Santini ZI, Koyanagi A, Tyrovolas S, et al. Social network typologies and mortality risk among older people in China, India, and Latin America: A 10/66 Dementia Research Group population-based cohort study. Soc Sci Med 2015;147:134-143.
2. Sosa AL, Albanese E, Prince M, et al. Population normative data for the 10/66 Dementia Research Group cognitive test battery from Latin America, India and China: a cross-sectional survey. BMC Neurol 2009;9:1471-2377.
3. Llibre Rodriguez JJ, Ferri CP, Acosta D, et al. Prevalence of dementia in Latin America, India, and China: a population-based cross-sectional survey. Lancet 2008;372:464-474.
4. Ferri CP, Prince M. 10/66 Dementia Research Group: recently published survey data for seven Latin America sites: Int Psychogeriatr. 2010 Feb;22(1):158-9. doi: 10.1017/S1041610209990901. Epub 2009 Sep 7.
5. Prince M, Acosta D, Ferri CP, et al. Dementia incidence and mortality in middle-income countries, and associations with indicators of cognitive reserve: a 10/66 Dementia Research Group population-based cohort study. Lancet 2012;380:50-58.
6. Prince M, Comas-Herrera A, Knapp M, Guerchet M, Karagiannidou M. World Alzheimer report 2016: improving healthcare for people living with dementia: coverage, quality and costs now and in the future. . London: UK: Alzheimer's Disease International (ADI), 2016.
7. Prince M, Prina M, Guerchet M, Prince M, Prina M, Guerchet M. World Alzheimer Report 2013. London: Alzheimer's Disease International, 2013.
8. Prince M, Bryce R, Ferr C. World Alzheimer report 2011. UK: Alzheimer's Disease International, 2011.
9. Organization WH. Dementia: A Public Health Priority: World Health Organization, 2012.
10. Prince M, Bryce R, Albanese E, Wimo A, Ribeiro W, Ferri CP. The global prevalence of dementia: a systematic review and metaanalysis. Alzheimer's & dementia : the journal of the Alzheimer's Association 2013;9:63-75.
11. Gonzalez FJ, Gaona C, Quintero M, Chavez CA, Selga J, Maestre GE. Building capacity for dementia care in Latin America and the Caribbean. Dement Neuropsychol 2014;8:310-316.
12. Baez S, Ibanez A. Dementia in Latin America: An Emergent Silent Tsunami. Front Aging Neurosci 2016;8:253.
13. Manes F. The huge burden of dementia in Latin America. The Lancet Neurology 2016;15:29.
14. Custodio NS, Wheelock A, Thumala D, Slachevsky A. Dementia in latin america: epidemiological evidence and implications for public policy. Frontiers in aging neuroscience 2017:10.3389/fnagi.2017.00221.
15. Kinsella K, He W. An Aging World: 2008 International Population Reports. Washington, DC: U.S. Government Printing Office, 2009.
16. Bongaarts J. Human population growth and the demographic transition. Philosophical transactions of the Royal Society of London Series B, Biological sciences 2009;364:2985-2990.
17. Adsera A, Menendez A. Fertility changes in Latin America in the context of economic uncertainty. Popul Stud (Camb) 2011;65:37-56.
18. Savedoff WD, de Ferranti D, Smith AL, Fan V. Political and economic aspects of the transition to universal health coverage. Lancet 2012;380:924-932.

19. Ottersen OP, Dasgupta J, Blouin C, et al. The political origins of health inequity: prospects for change. Lancet 2014;383:630-667.
20. International WHOaAsD. Dementia: a public health priority: World Health Organization, 2012.
21. Hojman DA, Duarte F, Ruiz-Tagle J, Budnich M, Delgado C, Slachevsky A. The cost of dementia in an unequal country: The case of Chile. PloS one 2017;12:e0172204.
22. Thumala D, Kennedy BK, Calvo E, et al. Aging and health policies in Chile: new agendas for research. Health Systems & Reform 2017:00-00.