

NOTE #14

Action Plan design tools — the Action Plan template

By **Giovanni Caiati and Claudia Colonnello**



RRI IMPLEMENTATION IN BIOSCIENCE ORGANISATIONS

GUIDELINES FROM THE  STARBIOS2 PROJECT



Andrea Declich with the STARBIOS2 partners



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Organizing and designing an Action Plan within a project like STARBIOS2 is a difficult task. One of the main difficulties is that the 5 RRI keys, albeit related to a single framework, are also very different from each other in terms of objectives and activities. To assist the Action Plan in the design phase in this section a set of tools were suggested during the implementation of the project. Such tools – that as a whole constitute a detailed design template for the Action Plans – are described below.

The template is a tool that also serves to make the contents of the Action Plan intersubjective between the members of the Core Team. For this reason, it facilitates the control of the implementation of the envisaged actions through the identification of deadlines. The Template, obviously, is not a guide to the identification of the problems on which to intervene, the actions to implement and the subjects with which to implement them.

1. Streams of Action (SoA) Sheet

In order to draft the detailed Action Plan it is important to single out the **main thematic elements** which should constitute its “building blocks”. These elements may be called “**Streams of Actions**” (SoA). The planning process should result in a description of each Stream of Actions, in which the following components should be included: a premise (based on the needs of the individual institution/research organisation); a specific function within the project; and a set of expected outcomes in terms of structural change.

As the term itself implies, each SoA is made up of a mutually coordinated set of actions aimed to a specific purpose. Focusing on

the Stream of Actions limits the risk of working on many individual and mutually disconnected actions that could be ineffective, unable to continue after the project lifespan and to produce the expected long-term effects in terms of structural change. In some way, each SoA could be understood as a separate micro-project, with its own assumptions, objectives, actions and expected impacts somehow independent from other SoAs (albeit resonant with them).

Each Stream of Actions may be composed of the following items.

- **Code:** Attribute a code to the SoA using an upper-case letter (A, B, C, etc.).
- **Title:** Give a title to the SoA.
- **Area:** Specify one of the five RRI keys or the "transversal area"²⁸ the SoA refers to.
- **Context:** Provide a short description of the organisation's needs. This may be useful in order to frame the goal of the SoA in the specific context of the Action Plan.
- **Aim:** Describe the main aim of the SoA.
- **Target groups:** Specify the group of people, the institution/s or the organisation/s involved with or beneficiary of the SoA.
- **Duration:** Specify the duration of the SoA. SoAs may not last throughout the entire project lifespan.
- **Actions:** Provide a simple list of the planned actions included in the SoA. To better follow the Model of Structural Change, three different types of action can be distinguished.
 - **Detailed design of the action/s:** It could be necessary to focus the initial activities of the SoA to collect some additional information on the very specific issues connected with the concerned activity, also including literature or documentary reviews, internal consultations and other participative inquiries. This would also contribute in starting disseminating the initiative and collecting different points of view on its practical implementation. A set of activities should be scheduled in which the Core Team discusses and shapes

²⁸ This area focuses on those SoA pertaining to the Action Plan as a whole, such as the management, the periodic revision of the Action Plan, or any cross-cutting action affecting more than one RRI key.

each SoA. These activities, indeed, beyond their obvious practical aim, may represent the first step for creating a basis for consensus and involvement of internal and external stakeholders. Forms of participation and discussion could therefore be incorporated in the planning, from the Core Team to more extended groups of stakeholders, first of all including internal groups and offices active on RRI issues, when relevant.

- **Implementation action/s:** these are the main components of the SoA, which are of course different for the various types of measures, including the preparation of training sessions, the organisation of public events, negotiation processes, publishing activities, etc.
- **Reporting and follow-up actions:** It is convenient to foresee follow-up activities in which internal or external communication of results, as well as reporting activities and deliverable preparation can be envisaged. Furthermore, activities oriented to sustainability arrangements for the institutionalization of successful actions need to be foreseen, when possible.
- **Agency Mobilisation:** Indicate people, groups or institutions within the university that may be involved in the implementation of the activities and in their design. It is particularly useful to establish if and how the leadership of the organisation can be involved.
- **Coordination mechanisms:** Indicate the interactions of the SoA with other SoAs included in the Action Plan, other activities or initiatives already in place in the research institution or other actions developed within the STARBIOS2 project.
- **Sustainability / Structural impact:** Indicate how the stream of actions could have an impact beyond the project lifespan (it is an approximate description of the expected or desirable impacts as they can be established at the design stage).

A template and an example of SoA Sheet are given in the **Tool 1**. The example is drawn from the DoA/WP2 and therefore from the Tor Vergata Action Plan. The example below, however, is purely indicative and does not correspond to the real activities proposed by this partner.

The **number of Streams of Action** in each Action Plan may largely vary. In the STARBIOS2 project the SoAs of the Action Plans **ranged from 11 to 20**. These figures, like all other indications, are not binding but only indicative of the type of work required by an Action Plan.

2. Summary tables

Summary tables are a second important programming tool proposed during the STARBIOS2 project. They are useful to check the workload required by the AP as a whole (both in general and in any phase of the project). In addition, the summary tables can help understand the possible interactions between the different parts of the Action Plan so as to better assess its effectiveness. Two tables are suggested:

- The **Action Plan Summary Chart (Tool 2)**, that brings together all the SoAs and, within them, the individual actions, without showing when actions are planned.
- The **Action Plan GANTT Chart (Tool 3)**, that allows to view all the planned activities over time and to identify any work overload situation in any given period.

The detailed design of the Action Plan has been revised on an annual basis during the STARBIOS2 project.

REFERENCES

- Ahuja, S.K., Aiuti, F., Berkhout, B., Biberfeld, P., Burton, D.R., Colizzi, V., Deeks, S.G., Desrosiers, R.C., Dierich, M.P., Doms, R.W., Emerman, M., Gallo, R.C., Girard, M., Greene, W.C., Hoxie, J.A., Hunter, E., Klein, G., Korber, B., Kuritzkes, D.R., Lederman, M.M., Malim, M.H., Marx, P.A., McCune, J.M., McMichael, A., Miller, C., Miller, V., Montagnier, L., Montefiori, D.C., Moore, J.P., Nixon, D.F., Overbaugh, J., Pauza, C.D., Richman, D.D., Saag, M.S., Sattentau, Q., Schooley, R.T., Shattock, R., Shaw, G.M., Stevenson, M., Trkola, A., Wainberg, M.A., Weiss, R.A., Wolinsky, S., Zack, J.A. (2006). A plea for justice for jailed medical workers. *Science*, 314(5801).
- Alberts, B., Kirschner, M.W., Tilghman, S., & Varmus, H. (2014). Rescuing US biomedical research from its sistemi flaws. *Proceedings of the National Academy of Sciences*, 111(16).
- Alsop, R., Bertelsen, M., Holland, J. (2006). Empowerment in practice: from analysis to implementation, The International Bank for Reconstruction and Development/The World Bank.
- Ambrosio, A.M., Mariani, M.A., Maiza, A.S., Gamboa, G.S., Fossa, S.E., Bottale, A.J. (2018). Protocol for the production of a vaccine against Argentine Hemorrhagic Fever in Maria S. Salvato (ed.) Hemorrhagic Fever Viruses: Methods and Protocols. *Methods in Molecular Biology*, vol. 1604. Springer. Doi 10.1007/978-1-4939-6981-4_24.
- Andoh, C.T. (2011). Bioethics and the challenges to its growth in Africa. *Open journal of philosophy*. 1(02), 67-75. 10.4236/ojpp.2011.12012.
- Bamgbose, A. (2011). African languages today: The challenge of and prospects for empowerment under globalization. *In Selected proceedings of the 40th Annual Conference on African Linguistics*. ed. Eyamba G. Bokamba, et al., 1-14. Cascadilla Proceedings Project Somerville. www.lingref.com, document #2561.
- Barugahare, J. (2018). African bioethics: methodological doubts and insights. *BMC medical ethics*. 19(1), 98. 10.1186/s12910-018-0338-6.
- Battilana, J., Leca B., and Boxenbaum E. (2009). "How actors change institutions: towards a theory of institutional entrepreneurship." *Academy of Management annals* 3.1 (2009).
- BBSRC Biotechnology and Biological Sciences Research Council (2018). "Forward look for UK Bioscience" released on 29 September 2018. <https://bbsrc.ukri.org/documents/forward-look-for-uk-bioscience-pdf/> (accessed on: 05/09/2019).
- Beckert, J. (1999). Agency, entrepreneurs, and institutional change. The role of strategic choice and institutionalized practices in organisations. *Organisation studies*, 20(5).
- Bendels, M.H., Dietz, M.C., Brüggmann, D., Oremek, G.M., Schöffel, N., Groneberg, D.A. (2018). Gender disparities in high-quality dermatology research: a descriptive bibliometric study on scientific authorships. *BMJ Open* 2018;8:1-11. doi:10.1136/bmjopen-2017-020089

- Berger, P., & Luckmann, T. (1969). *La costruzione sociale della realtà*. Il Mulino, Bologna.
- Besley, J.C., & Nisbet, M.C. (2013). How scientists view the public, the media and the political process. *Public Understanding of Science*, 22(6), 644–659. <https://doi.org/10.1177/0963662511418743>
- Bijker, W.E. & d'Andrea, L. (eds.) (2009). *Handbook on the Socialisation of Scientific and Technological Research, Social Sciences and European Research Capacities*, Rome: River Press Group.
- Boylan, J., Dacre, J., Gordon, H. (2019). Addressing women's under-representation in medical leadership. *The Lancet*. 2019; 393(10171): e14.
- Bromme, R. (2000). Beyond one's own perspective. The psychology of cognitive interdisciplinarity. In P. Weingart & N. Stehr (Eds.), *Practising interdisciplinarity* (pp. 115-133). Toronto: Toronto University Press.
- Bubela, T. (2006). Science communication in transition: Genomics hype, public engagement, education and commercialization pressures. *Clinical Genetics*, 70(5), 445–450. <https://doi.org/10.1111/j.1399-0004.2006.00693.x>
- Bubela, T., Hagen, G., & Einsiedel, E. (2012). Synthetic biology confronts publics and policy makers: Challenges for communication, regulation and commercialization. *Trends in Biotechnology*, 30(3), 132–137. <https://doi.org/10.1016/j.tibtech.2011.10.003>
- Burchell, K. (2015). *Factors affecting public engagement by researchers: literature review*, Policy Studies Institute, London, <https://wellcome.ac.uk/sites/default/files/wtp060036.pdf> (accessed on: 24/07/2019).
- Burns, D., Squires, H., (2011). *Embedding public engagement in higher education: Final report of the national action research programme*, NCCPE. https://www.publicengagement.ac.uk/sites/default/files/publication/action_research_report_0.pdf (accessed on: 26/07/2019)
- Burns, T.W., O'Connor, D.J., & Stockmayer, S.M. (2003). Science communication: A contemporary definition. *Public Understanding of Science*, 12(2), 183–202. <https://doi.org/10.1177/09636625030122004>
- Capps, D.K., & Crawford, B.A. (2013). Inquiry-Based Instruction and Teaching About Nature of Science: Are They Happening? *Journal of Science Teacher Education*, 24.
- Cartwright, N., & Hardie, J. (2012). *Evidence-based policy: A practical guide to doing it better*. Oxford: Oxford University Press.
- Caulfield, T. (2005). Popular Media, Biotechnology, and the “Cycle of Hype”. *Houston Journal of Health Law & Policy*, 337(2004).
- Chen, H.T. (2012). Evaluation von Programmen und Projekten für eine demokratische Kultur. In R. Strobl, O. Lobermeier, W. Heitmeyer (eds.). *Evaluation von Programmen und Projekten für eine demokratische Kultur*. Fachmedien Wiesbaden: Springer.
- Clark, B.R. (1998). *Creating Entrepreneurial Universities: Organisational Pathways of Transformation*. Pergamon, http://blog.ub.ac.id/yogidwiatmoko/files/2012/12/gibb_hannon.pdf (accessed on: 17/09/2019).

- Clark, H. (1996). *Using Language*. Cambridge: Cambridge University Press.
- Clarke, L.J., & Kitney, R.I. (2016). Syntheticbiology in the UK—an outline of plans and progress. *Synthetic and systems biotechnology*, 1(4), (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5625736/> (accessed on: 18/07/2019).
- Colizzi V., de Oliveira T., Roberts R.J. (2007). Libya should stop denying scientific evidence on HIV. *Nature*; 448 (7157):992.
- Colizzi V., et al. (2019). Structural Transformation to Attain Responsible BIOSciences (STARBIOS2): Protocol for a Horizon 2020 Funded European Multicenter Project to Promote Responsible Research and Innovation. *JMIR Res Protocl* 8(3):e11745, <https://www.researchprotocols.org/2019/3/e11745/> (accessed on: 30/09/2019).
- Condit, C. (2001). What is “public opinion” about genetics? *Nature*, 2(10). <https://doi.org/10.1038/35093580>
- d’Andrea, L., Marta, F.L., Kahma, N. and Vase, S., (2017). FIT4RRI, Project Report on the Literature Review, Deliverable 1.1 (public), December 31st, 2017, <https://zenodo.org/record/1434349#.W8iFg3szbcs> (accessed on: 30/09/2019).
- d’Andrea, L., & Declich, A. (2005). The sociological nature of science communication. *JCOM*, 4(2).
- d’Andrea, L., Quaranta, G., & Quinti, G. (2005). *Manuale sui processi di socializzazione della ricerca scientifica e tecnologica*. CERFE, Rome.
- Dahler-Larsen, P. (2006). Evaluation after Disenchantment? Five Issues Shaping the Role of Evaluation in Society. In Shaw, I.F., Greene, J.C., Mark, M.M. (eds.), *The Sage Handbook of Evaluation*. London: Sage Publications.
- Dahler-Larsen, P. (2012). *The evaluation society*. Stanford: Stanford University Press.
- D’Armiento, J., Witte, S.S., Dutt, K. Wall, M., McAllister, G. (2019). Achieving women’s equity in academic medicine: challenging the standards. *The Lancet*. 2019; 393(10171).
- Declich G., d’Andrea, L. (2018), “Triggering Institutional Change Towards Gender Equality In Science. Final Guidelines of the TRIGGER Project”, project funded by the European Commission under the FP7 for Research.
- de Oliveira, T., Pybus, O.G., Rambaut, A., Salemi, M., Cassol, S., Ciccozzi, M., Rezza, G., Gattinara, G.C., D’Arrigo, R., Amicosante, M., Perrin, L., Colizzi, V., Perno, C.F. (2006). Benghazi Study Group. Molecular epidemiology: HIV-1 and HCV sequences from Libyan outbreak. *Nature*. 2006; 444.
- Döring, N., & Bortz, J. (2016). *Forschungsmethoden und Evaluation in den Sozial- und Humanwissenschaften*. Berlin: Springer.
- Eden, G., Jirotko, M., & Stahl, B. (2013). Responsible research and innovation: Critical reflection into the potential social consequences of ICT. In *Research Challenges in Information Science (RCIS), 2013 IEEE Seventh International Conference on*. IEEE.
- Elster, D. (2016). Deliverable 5.1 First Interim Report, University of Bremen, Bremen.
- Elster, D., Barendziak, T., Birkholz, J. (2016). Science Education as a Trigger to Attain Responsible Research and Innovation. In *Pixel: New Perspectives in*

Science Education, Conference Proceedings 2017, Florence/LibreriaUniversitariaEdizioni.

- Elster, D., Barendziak, T., Birkholz, J. (2019). Towards a sustainable and open science. Enhancing responsible research and innovation in the biosciences at the University of Bremen. Bremen: University of Bremen.
- Equality Challenge Unit (2005). Athena SWAN Charter. 7th Floor, Queen's House, 55/56 Lincoln's Inn Fields, London, WC2A 3LJ <https://www.ecu.ac.uk/equality-charters/athena-swan/>
- ERA CoBioTech (2018). Strategic Agenda – a vision for biotechnology in Europe, November 2018, https://www.cobiotech.eu/lw_resource/datapool/systemfiles/elements/files/7D5DE99D41EC4DCCE0539A695E869159/current/document/114492_ERA_CoBio_a_genda_final_high-res.pdf (accessed on 18/07/19)
- ERA CoBioTech (2018). Strategic Agenda – a vision for biotechnology in Europe, https://www.cobiotech.eu/lw_resource/datapool/systemfiles/elements/files/7D5DE99D41EC4DCCE0539A695E869159/current/document/114492_ERA_CoBio_a_genda_final_high-res.pdf (accessed on: 18/07/19)
- ESFRI European Strategy Forum on Research Infrastructures (2006), Roadmap for European Research Infrastructure. Report of the Biology and Medical Science. Roadmap Working Group, October 2006, https://ec.europa.eu/research/infrastructures/pdf/esfri/esfri_roadmap/roadmap_2006/bms-report-roadmap-wg-2006_en.pdf (accessed on: 05/09/2019).
- European Commission (2016). SheFigures 2015, Directorate-General for Research and Innovation, Brussels.
- Eze, M.O. (2008). What is African communitarianism? Against consensus as a regulative ideal. *South African Journal of Philosophy*. 27(4). 10.4314/sajpem.v27i4.31526
- Faria, N.R, Quick, J, Claro I.M, Theze, J, de Jesus, J.G, Giovanetti, M. et al. (2017). Establishment and cryptic transmission of Zika virus in Brazil and the Americas. *Nature* 546.
- Faria, N.R. et al. (2016). Mobile real-time surveillance of Zika virus in Brazil. *Genome Medicine*, 96.
- Felt, U., Fochler, M., & Sigl, L. (2017). IMAGINE RRI: A Card-based Method for Reflecting Responsibility in Life Science Re-search
- Filardo G, da Graca B, Sass DM, Pollock BD, Smith EB, Martinez MA. Trends and comparison of female first authorship in high impact medical journals: observational study (1994-2014). *BMJ* 2016;352:1-8. doi:10.1136/bmj.i847
- Flipse, S.M., Van der Sanden, M.C., & Osseweijer, P. (2014). Setting up spaces for collaboration in industry between researchers from the natural and social sciences. *Science and engineering ethics*, 20(1).
- France, B., Gilbert, J.K. (2006). A model of communication about biotechnology. Rotterdam: Sense Publishers in cooperation with The New Zealand Biotechnology Learning Hub.
- Gade, C.B. (2012). What is ubuntu? Different interpretations among South Africans of African descent. *South African Journal of Philosophy*. 31(3). 10.1080/02580136.2012.10751789

- Gardy, J.L., and Loman N.J. (2018). Towards a genomics-informed, real-time, global pathogen surveillance system. *Nature Reviews Genetics* 19(1).
- Gerber, A. (2018). RRI: How to 'mainstream' the 'upstream' engagement. *Journal of Science Communication*, 17(3), C06, https://jcom.sissa.it/sites/default/files/documents/JCOM_1703_2018_C06.pdf (accessed on: 21/07/2019)
- Gibb, A. and Hannon, P. (2006). "Towards the entrepreneurial University?, in *International Journal of Entrepreneurship Education*, v. 4, http://blog.ub.ac.id/yogidwiatmoko/files/2012/12/gibb_hannon.pdf (accessed on: 30/10/2018)
- Gittelman, M., (2016). The revolution re-visited: Clinical and genetics research paradigms and the productivity paradox in drug discovery. *Res. Policy*, <http://dx.doi.org/10.1016/j.respol.2016.01.007>
- GREAT (2013). *Annual report on the main trends of SiS, in particular the trends related to RRI*, http://www.great-project.eu/deliverables_files/deliverables05.
- Griffiths, R. (2004). Knowledge production and the research- teaching nexus: The case of the built environment disciplines. *Studies in Higher Education* 29, no. 6.
- Healey, M. (2005). Linking research and teaching: Exploring disciplinary spaces and the role of inquiry- based learning. In *Reshaping the University: New Relationships Between Research, Scholarship and Teaching*, edited by R. Barnett. Maiden head, UK: McGraw- Hill/Open University Press.
- Herschberg, C., Benschop, Y., & van denBrink, M. (2018). Precarious postdocs: A comparative study on recruitment and selection of early-career researchers. *Scandinavian Journal of Management*, 34(4).
- Herzog, C. (2016). Successful comeback of the single-dose live oral cholera vaccine CVD 103-HgR. *Travel medicine and infectious disease*, 14(4). doi: 10.1016/j.tmaid.2016.07.003.
- Hill, S.C. et al. (2019). Emergence of the Zika virus Asian lineage in Angola. *bioRxiv* 520437; doi: <https://doi.org/10.1101/520437>.
- Jagsi, R., Guancial, E., Worobey, C., Henault, L., Chang, Y., Starr, R., Tarbell, N., Hylek, E. (2006). The 'Gender Gap' in Authorship of Academic Medical Literature – A 35-Year Perspective. *N Engl J Med* 2006;355.
- Jenkins, A. (2004). *A Guide to the Research Evidence on Teaching- Research Relations*. York, UK: The Higher Education Academy. Available online: https://www.heacademy.ac.uk/system/files/id383_guide_to_research_evidence_on_teaching_research_relations.pdf (accessed on: 20/06/2019).
- Kalpazidou Schmidt, E., Ovseik, P.V., Henderson, L.R., & Kiparoglou, V. (2019). Understanding the Athena SWAN award scheme for gender equality as a complex social intervention in a complex system: analysis of Silver award Action Plans in a comparative European perspective. *bioRxiv*. doi:10.1101/555482.
- Kalpazidou Schmidt, E. & Cacace, M. (2017). Addressing gender inequality in science: the multifaceted challenge of assessing impact. *Research Evaluation*, vol. 26, no 2.
- Kalpazidou Schmidt, E. & Cacace, M. (2018). Setting up a Dynamic Framework to Activate Gender Equality Structural Transformation in Research Organisations. *Science and Public Policy*, vol. 59.

- Kalpazidou Schmidt, E. (2009). Evaluation, in Bijker W. E. & d'Andrea (eds.), *Handbook on the Socialisation of Scientific and Technological Research, Social Sciences and European Research Capacities*, pp. 169-189, Rome: River Press Group.
- Kalpazidou Schmidt, E. (2016). Development of monitoring and assessment tools of structural transformation actions to attain responsible biosciences. STARBIOS2 report.
- Kalpazidou Schmidt, E.K., & Cacace, M. (2018). Setting up a Dynamic Framework to Activate Gender Equality Structural Transformation in Research Organisations. *Science and Public Policy*.
- Kuhlmann, S., Lindner, R., & Randles, S. (2016). Conclusion: making responsibility an institutionalised ambition. In *Navigating Towards Shared Responsibility in Research and Innovation: Approach, Process and Results of the Res-AGorA Project* (pp. 161-166). Fraunhofer ISI.
- Kwiek, M. (2015). "Academic Entrepreneurialism and the Changing Governance in Universities. Evidence from Empirical Studies", in Reihlen, W.M., Frost, J., Hattke, F. (eds.) *Multi-level Governance of Universities: The Role of Strategies, Structures, and Controls*
- Lawrence, T., Suddaby, R., & Leca, B. (2011). Institutional work: Refocusing institutional studies of organisation. *Journal of Management Inquiry*, 20(1).
- Lederman, N. G., Antink, A., & Bartos, S. (2014). Nature of science, scientific inquiry, and socio-scientific issues arising from genetics: A pathway to developing a scientifically literate citizenry. *Science & Education*, 23(2).
- Lindlof, T.R. (1995). *Qualitative Communication Research Methods*. London: Sage.
- Lutz, D.W. (2009). African Ubuntu Philosophy and Global Management. *Journal of Business Ethics*. 84(3), 313-328. 10.1007/s10551-009-0204-z
- Mann, A., & Di Prete, T.A., (2013). Trends in gender segregation in the choice of science and engineering majors. *Social science research*, 42(6), <https://www.ncbi.nlm.nih.gov/pubmed/24090849> (accessed on: 26/07/2019)
- March, J.G., Gherardi, S., & Cimmino, S. (1993). *Decisioni e organizzazioni*. Il Mulino, Bologna.
- Mezzana, D. (2018). Some Societal Factors Impacting on the Potentialities of Electronic Evidence, in M.A. Biasiotti et al. (eds.), *Handling and Exchanging Electronic Evidence Across Europe, Law, Governance and Technology Series 39*, Springer, https://doi.org/10.1007/978-3-319-74872-6_14.
- Mezzana, D. (ed.) (2011), *Technological responsibility. Guidelines for a shared governance of the processes of socialisation of scientific research and innovation, within an interconnected world*, Roma, CNR: www.scienzecittadinanza.org/public/SetDevGuidelines.pdf (accessed on: 08/11/2018)
- Msoroka, M.S. & Amundsen, D. (2018). One size fits not quite all: Universal research ethics with diversity. *Research Ethics*. 14(3), 1-17. 10.1177/1747016117739939.
- Musselin, C. (2007). *The Transformation of Academic Work: Facts and Analysis*. Research & Occasional Paper Series: CSHE. 4.07. *Center for studies in higher education*;

- Naveca, F.G. et al. (2019). Genomic, epidemiological and digital surveillance of Chikungunya virus in the Brazilian Amazon. *PLoS Negl Trop Dis*, 13, 3-0007065.
- Nowotny, H. (2007). Knowledge Production and its Constraints: epistemic and societal considerations, paper presented at the Gulbenkian Foundation, Lisbon, 2007, http://helga-nowotny.eu/downloads/helga_nowotny_b58.pdf (accessed on: 18/07/2019)
- Nowotny, H., Scott, P., Gibbons, M., & Scott, P.B. (2001). *Re-thinking science: Knowledge and the public in an age of uncertainty*. Cambridge: Polity.
- Owen, R., Forsberg, E-M., Shelley-Egan, C. (2019). RRI-Practice Policy Recommendations and Roadmaps, RRI-Practice project report. Deliverable 16.2, <https://www.rri-practice.eu/knowledge-repository/recommendations/> (accessed on: 21/07/2019)
- Pan-African Bioethics Initiative (PABIN), (2003). PABIN Third Conference: **Good Health Research Practices in Africa**. Addis Ababa, Ethiopia.
- Pawson, R. & Tilley, N. (1997). *Realistic Evaluation*. London: Sage.
- Pierini, M. (2008). Le prix de la liberté: Libye, les coulisses d'une négociation, Actes Sud.
- Pinheiro, R., & Stensaker, B. (2014). Designing the entrepreneurial university: The interpretation of a global idea. *Public Organisation Review*, 14(4).
- Quaranta, G. (1985). L'era dello sviluppo, Franco Angeli, Milano.
- Quick, J., et al. (2017) Multiplex PCR method for MinION and Illumina sequencing of Zika and other virus genomes directly from clinical samples. *Nat Protoc*, 2017. 12(6).
- Reale, E., Nedeva, M., Thomas, D., & Primeri, E. (2014). Evaluation through impact: A different viewpoint. *Fteval Journal*, 39.
- Reydon, T.A., Kampourakis, K., & Patrinos, G.P. (2012). Genetics, genomics and society: the responsibilities of scientists for science communication and education. *Personalized Medicine*, 9(6). <https://doi.org/10.2217/pme.12.69>
- Rog, D.J. (2012). When background becomes foreground: Toward Context-Sensitive Evaluation Practice. *New Directions for Evaluation*, 135.
- Rome Declaration on Responsible Research and Innovation in Europe https://ec.europa.eu/research/swafs/pdf/rome_declaration_RRI_final_21_November.pdf (accessed on: 26/07/2019)
- Royal Society (2006). *Survey of factors affecting science communication by scientists and engineers*, the Royal Society, https://royalsociety.org/~media/Royal_Society_Content/policy/publications/2006/1111111395.pdf (accessed on: 24/07/2019).
- Ruggiu, D. (2015). Anchoring European governance: Two versions of responsible research and innovation and EU fundamental rights as 'Normative anchor points'. *NanoEthics*, 9(3).
- Sadler, T.D. (2011). *Socio-scientific issues in the classroom*. Heidelberg, Springer.
- Sambala, E.Z., Cooper, S. and Manderson, L. (2019). Ubuntu as a Framework for Ethical Decision Making in Africa: Responding to Epidemics. *Ethics & Behavior*. 10.1080/10508422.2019.1583565
- Shendure, J., Ji, H., (2008). Next-generation DNA sequencing. In *Nature Biotechnology*, 26.

- Smith, R.D.J., Scott, D., Kamwendo, Z.T., Calvert, J. (2019). An Agenda for Responsible Research and Innovation in ERA CoBioTech. Swindon, UK: Biotechnology and Biological Sciences Research Council and ERA CoFund on Biotechnology
- https://www.cobiotech.eu/lw_resource/datapool/systemfiles/elements/files/85886BE9C7161C71E0539A695E865A64/live/document/ERA_CoBioTech_RRI_Framework.pdf (accessed on: 18/07/19)
- Spruit, S.L., Hoople, G.D., & Rolfe, D.A. (2016). Just a cog in the machine? The individual responsibility of researchers in nanotechnology is a duty to collectivize. *Science and engineering ethics*, 22(3).
- Stephan, P. (2013). How to exploit postdocs. *BioScience*, 63(4).
- Stilgoe, J., Owen, R., & Macnaghten, P. (2013). Developing a framework for responsible innovation. *Research Policy*, 42(9).
- Sutcliffe, H. (2011). A report on Responsible Research and Innovation for the European Commission. Retrieved from http://ec.europa.eu/research/science-society/document_library/pdf_06/rri-report-hilary-sutcliffe_en.pdf (accessed on: 30/9/2019).
- Temoshok, L.R., & Wald, R.L. (2008). Integrating multidimensional HIV prevention programs into healthcare settings. *Psychosomatic medicine*, 70(5). doi: 10.1097/PSY.0b013e31817739b4.
- Thézé, J. et al. (2018). Genomic Epidemiology Reconstructs the Introduction and Spread of Zika Virus in Central America and Mexico. *Cell Host Microbe*. 23.
- Van Belle, S.B., Marchal, B., Dubourg D. and Kegels, G. (2010). How to develop a theory-driven evaluation design? Lessons learned from an adolescent sexual and reproductive health programme in West Africa. *BMC Public Health*, 10, 741.
- Van Schomberg, V. & van Schomberg, R. (2013). A Vision of Responsible Research and Innovation. In Owen, R., Heintz, M. & Bessant J. (Eds.), *Responsible Innovation* (pp. 51-74). London: John Wiley & Sons, Ltd.
- Von Schomberg, R. (2019). Why Responsible Innovation. In *The International Handbook on Responsible Innovation. A Global Resource*. Von Schomberg, R. and Hankins, J. (Eds.). Cheltenham: Edward Elgar Publishing. Forthcoming.
- Watermeyer, R. (2015). Lost in the 'third space': the impact of public engagement in higher education on academic identity, research practice and career progression. *European Journal of Higher Education*, 5:3, <http://www.tandfonline.com/doi/pdf/10.1080/21568235.2015.1044546> (accessed on: 24/07/2019).

ABOUT THE STARBIOS2 GUIDELINES

This guideline aims to help readers formalize and trigger structural change aimed at introducing appropriate RRI-related practices to their own organisations. This is not a series of prescriptions, but an itinerary of reflection and self-interpretation addressed to different actors within the biosciences. To support this itinerary of reflection and self-interpretation, the document provides...

- a description of a general RRI Model for research organisations within the biosciences, that is a set of ideas, premises and “principles of action” that define the practice of RRI in bioscience research organisations,
- some practical guidance for designing interventions to promote RRI in research organisations in the Biosciences, putting into practice the RRI Model,
- a set of useful practices in implementing the structural change process,
- and information on particular STARBIOS2 cases and experiences, as well as materials, tools and sources, are also provided in the Appendix and in the Annex.



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