12th European Public Health Conference 2019 in Marseille, France:
"Building bridges for solidarity and public health"
Workshop (7.L) "Health in EIA", 22 Nov 2019

Health in Environmental Impact Assessment (EIA): Gaining strength from the "Family of health assessments" approach

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Structure

1. Background incl. (health-related) impact assessments
2. Other health assessments
3. Options / suggestions for EIA development
4. Further benefits for (E)IA arising from „family“ perspective; and conclusion

1. Background incl. (health-related) impact assessments

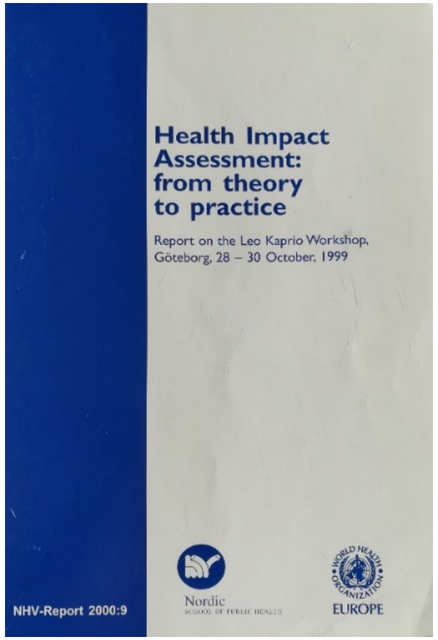
For connecting “scientific knowledge” and “policy-making” with each other (on local, regional, international level): EIA is an important approach

Both the idea and the legal regulations have a history of decades

Health is meant to be included, from the beginning

But: especially concerning health, the situation still appears as unsatisfactory.

Health Impact Assessment (HIA)


Health Impact Assessment: from theory to practice

Report on the Leo Kaprio Workshop, Göteborg, 28 – 30 October, 1999

NHV-Report 2000:9

Nordic School of Public Health

WHO EUROPE

Fehr, R. (2000): Environmental Health Impact Assessment: the example of transportation. In: Diwan, V., Douglas, M., Karlberg, I. et al. (eds.): Health Impact Assessment: from theory to practice. Report on the Leo Kaprio workshop, Gothenburg, 28-30 October 1999. WHO-Europe and Nordic School of Public Health, Gothenburg, Sweden. NHV-report 2000:9, pp.213-229

Environmental health impact assessment: the example of transportation

Rainer Fehr,
Institute of Public Health, Bielefeld

This paper summarizes a view of Health Impact Assessment (HIA) which has evolved over several years (1 – 5). The current paper intends to contribute the following:

- a selective chronology of HIA
- a sketch of WHO's Transport, Environment and Health (TEH) project and the related HIA workshop in Bielefeld, Germany, May 1999
- components of a systematic framework for HIA
- ideas for future developments of HIA.

2000

Step / components	Tools and resources
Step 4: Background situation Compilation of background pollution data concerning: • Air (outdoor / indoor) • Water (drinking water, groundwater, bodies of surface water) • Soil, incl. contaminated sites • Food	• Environmental monitoring • Environmental reports, e.g. UBA: "Daten zur Umwelt" • Systematic information on emissions from point sources / industrial plants. Toxics Release Inventory (TRI) in USA • Geographic Information Systems (GIS)
Step 5: Prediction of future pollution levels • Prediction of future emissions from the project • (Based on predicted emissions:) Pollutant dispersion modelling • (Based on dispersion modelling:) Prognosis of future pollutant concentrations in environmental media	• Technology-related specifications as a basis for prognosis of emissions from the project • (Multi-media) dispersion models (e.g. ISC-LT, MISKAM) and determination of dilution factors, using e.g. EML, EpiCode, Risk*Assistant, RiskPro • Tools to support selection of dispersion models, e.g. IMES
Steps 6 and 7: Prediction and assessment of health impacts • Qualitative assessment of impact on quality of life, e.g. by rating / expert judgement • Survey of citizen concerns about health impairments and quality of life • Total exposure assessment, using all pathways and various scenarios, e.g. concerning patterns of food consumption and leisure activities • Comparison with legal limit values and / or recommended reference values, e.g. Acceptable Daily Intake (ADI) • Quantitative Risk Assessment (QRA), especially for carcinogens	• Bibliographies, e.g. MEDLINE, SOMED • Population survey, using software for questionnaire design and statistical analysis • Round-table discussions with public participation • Tools for dose-response estimation, e.g. GEN.T, EPID.T • Tools for exposure modeling, e.g. EML, @risk, HRA92, Risk*Assistant, RiskPro • Sources of reference values , e.g. HEAST, IRIS, TOMES plus, NIS • Tools for determination of Hazard Index and Hazard Quotient, e.g. HRA92 • Tools for risk (cancer risk, cancer burden), e.g. HRA92, Risk*Assistant, RiskPro

WHO Collaborating Center for Regional Health Policy and Public Health

Landesinstitut für Gesundheit und Arbeit des Landes Nordrhein-Westfalen

Health Impact Assessment (HIA) in Germany

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Context: In the European arena, Health Impact Assessment (HIA), either within Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA), or performed independently, evolves into comprehensive 'cultures', including, e.g., HIA conferences, guidelines, and gateways. In Germany, up to now there is little explicit reference to HIA. This paper aims to illustrate that approaches towards HIA in Germany do exist which can serve as a basis for more comprehensive HIA development in the country.

Methods and materials: From current and past activities of LIGA.NRW and predecessor institutes, 10 examples of health-related impact analyses were selected, based on a broad understanding of HIA. The HIAs are described and compared according to a set of descriptive (e.g. topic, qualitative and quantitative methods applied in the HIA) and evaluative (e.g. strengths and weaknesses of the HIA) criteria, with a focus on 'integrative' features.

Tab. Examples of Health Impact Assessments, conducted by LIGA.NRW (incl. predecessor insitutions) and/or U Bielefeld

Policy / Plan / Project	Type	Spatial reference	Qualitative aspects	Quantitative aspects
1. European Employment Strategy (EES) (Mekel, Haigh, Fehr, Welteke 2004)	Policy	Germany / Europe	• Policy analysis: Implementation in Germany, espec. flexibilisation of employments; literature reviews • Participatory workshop: Aspects of implementation of EU strategy in Germany; scenario development, prioritization	• Self-reported health status; absenteeism • Modeling the flexibilisation of employments • Point estimates and distributional estimates of additional and/or avoided cases of impaired health
2. Demographic change in Ruhr area (Terschüren, Mekel, Samson et al. 2009)	Baseline for policies	Federal state and subregion	• Decreasing and ageing population • Selection of appropriate groups of diagnoses: certain neoplasms; myocardial infarction; dementia	• Application of WHO methodology "Burden of disease", using Disability Adjusted Life Years (DALYs) • Based on predicted changes of age distribution: Estimation of changes of burden of disease
3. Joint regional land utili-zation plan Ruhr (Volmer, Welteke, Fehr 2010)	Plan	Consor-tium of 6 cities	• Planning process, structure and content of regional joint plan • Legal basis for human health as an item of concern • Coverage of health in the text / maps / environmental report; assessment and recommendations	(not implemented)
4. Housing subsidy program NRW (Sierig, Mekel, Fehr 2009) / in progress	Program	Federal state	• Analysis of components of the subsidy program • Causal web with various causal pathways • Participatory workshops	• Modeling of selected causal pathways • Point estimates of additional and/or avoided cases of disease and injury
5. Waste site extension (Kobusch, Serwe, Proto-schill-Krebs, Fehr 1995)	Project	Four hamlets	• Structure model with 7 exposure pathways • Complex physico-chemical processes within the waste site; range of emitted pollutants, e.g. in leachate; additional road traffic • Vulnerable populations, e.g. children and teenagers	• Modeling for „receptors" in several locations • (Carcinogenic) emissions, pollutant levels, exposures • Additional cancer risks and cancer cases • Noise exposure
6. Highway project: Circular road (Serwe, Protoschill-Krebs 1995)	Project	City / Outskirts	• Various siting options • Innercity traffic relief • Planning areas with vulnerable populations, e.g. seniors	• Traffic densities; chemical emissions, pollutant levels, exposures; noise exposures, espec. at night • Injuries and deaths due to traffic crashes
7. Drinking water privati-zation (Fehr, Mekel, Lacombe, Wolf 2003)	Policy	Federal state / D / Europe	• Qualitative model: legal requirements, „over-achievements" vs. economic approach • Identification of 8 carcinogens in drinking water	• Additional cancer cases: point estimates and distributional estimates for lifetime risks • Relative risks; additional cancer cases
8. Environmental tobacco smoke (ETS) and non-smoker protection (Hornberg, Samson et al., in prep.)	Policy	Federal state	• Non-smoker protection legislation in NRW (2008) • Affected by ETS: health of children (incl. pre-natal), of adults • Range of health impacts of ETS exposure	• Application of WHO methodology „Environmental burden of disease", before and after policy implementation • Estimation of fractions of burden of disease (e.g. DALYs) attributable to ETS
9. Living on a contamin-ated site (Mekel, Nolte, Fehr 1997; Mekel & Fehr 2000)	Baseline for clean-up projects	City quarters	• Discussion of Quantitative Risk Analysis for Impact Assessments • Sample applications: Settlements on sites contaminated with (i) cadmium and (ii) dioxins and furans	• Quantitative exposure assessment, using personal and chemical-specific parameters • Point estimates and probabilistic exposure estimates • Measured (HBM) vs. modeled exposure
10. Traffic noise / Children (Mekel & Sierig 2007, within ENHIS project)	Baseline for policies	E.g., cities	• Development of guideline for this topic • „Strong annoyance" and „sleep disturbance" were identified as proxy outcomes for which data were available • Various scenarios of noise reduction described	• Calculation of attributable cases, based on modeled exposures and adjusted exposure-response functions • Estimation of health gains under various scenarios

Results: The set of HIAs covers a wide range of topics. The generic public health impact assessments included in this study refer to: 'European Employment Strategy', 'Housing policy North Rhine-Westphalia 2010', 'Joint spatial planning of six Ruhr area cities', and 'Demographic change in the Ruhr area' (No. 1 - 4). Other impact assessments focus on environmental health topics, e.g. waste site extension, transport planning / urban ring road, and drinking water privatization. Several of these assessments were (or are currently being) conducted within EC-funded projects (EPHIA, ENHIS, RAPID).

Strength and weakness: As a general tendency, our HIAs reflect the stepwise procedure as described in HIA guidelines. Most of the HIAs involve some level of quantification for selected health determinants and/or health effects. Sometimes we also applied probabilistic modeling (No. 1, 9). For a large fraction of our HIAs, participation of stakeholders and/or public is underdeveloped or altogether missing. An example of strong effort and very limited success is example no. 1. On the other hand, in the currently ongoing example no. 4, stakeholder participation has already produced very valuable input.

Conclusions: In contrast with many other countries, in Germany the large potential of HIA for health protection and promotion is widely untapped. Beyond existing examples of feasibility, a broader debate on HIA is needed. Current auxiliary activities include a comparative analysis of HIA guidelines; the exploration of dedicated health plans on local/regional level to strengthen the health sector; and an initiative to study the whole 'family' of health-related impact assessments.

Links and Literature: on reverse page of the handout; and available from the author

2010

EUPHA

3rd European Public Health Conference AMSTERDAM 2010

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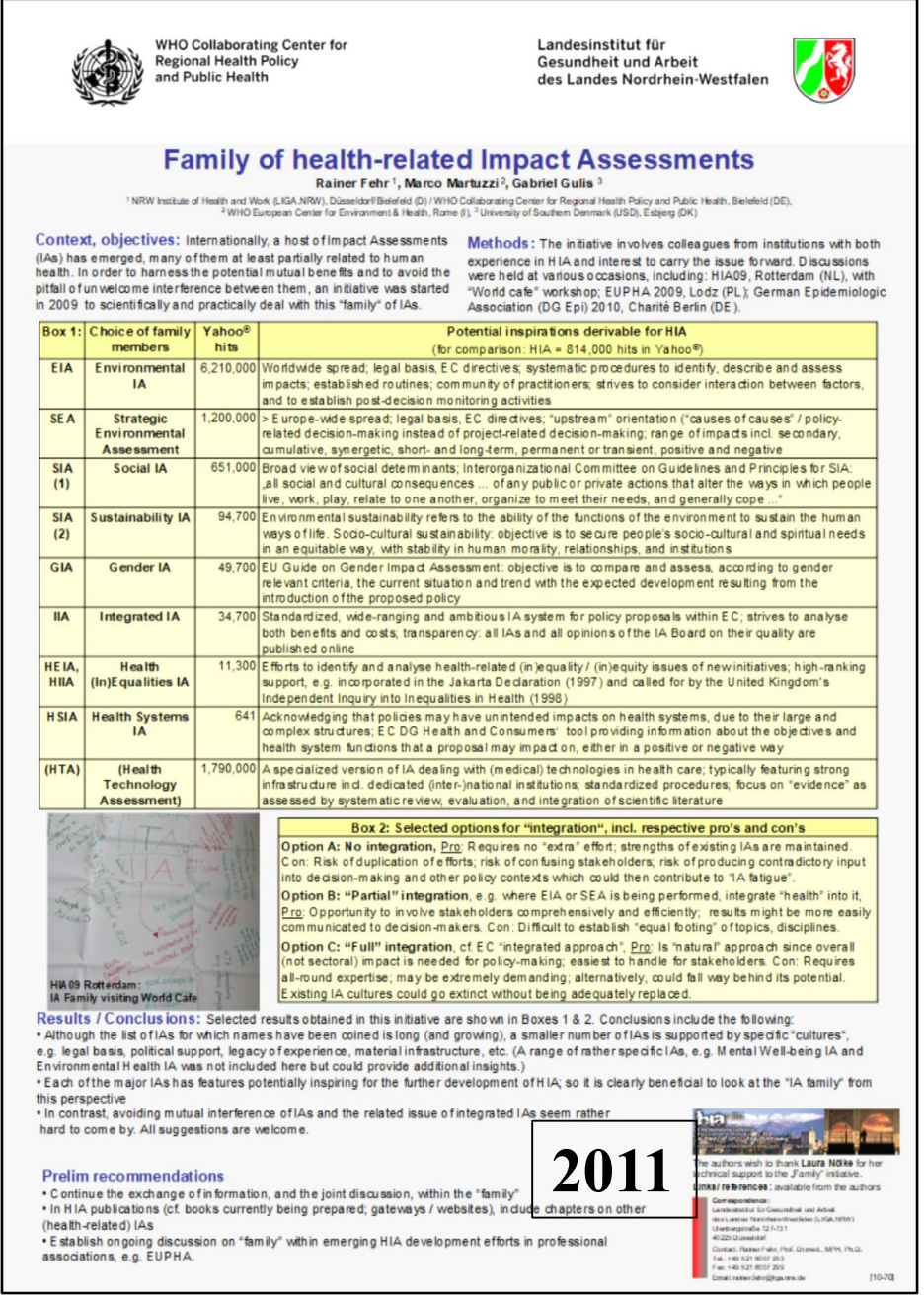
EIA, HIA and other impact assessments

From the beginning of work for HIA in Germany:

- a double pathway, pursuing both options: “health in EIA” and “stand-alone” HIA, and
- a focus on “comparisons”; comparative analyses were seen as highly useful sources for supplementing own experiences, incl. avoidance of pitfalls, and improvement of efficiency

From this background: decision to broaden the view and include “Family of Impact Assessments”.

(Health-related) Impact assessments



WHO Collaborating Center for Regional Health Policy and Public Health

Landesinstitut für Gesundheit und Arbeit des Landes Nordrhein-Westfalen

Family of health-related Impact Assessments

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[2] WHO European Center for Environment & Health, Rome (I), [3] University of Southern Denmark (USD), Esbjerg (DK)

Context, objectives: Internationally, a host of Impact Assessments (IAs) has emerged, many of them at least partially related to human health. In order to harness the potential mutual benefits and to avoid the pitfall of unwelcome interference between them, an initiative was started in 2009 to scientifically and practically deal with this "family" of IAs.

Methods: The initiative involves colleagues from institutions with both experience in HIA and interest to carry the issue forward. Discussions were held at various occasions, including: HIA09, Rotterdam (NL), with "World cafe" workshop; EUPHA 2009, Lodz (PL); German Epidemiologic Association (DG Epi) 2010, Charité Berlin (DE).

Box 1:	Choice of family members	Yahoo® hits	Potential inspirations derivable for HIA (for comparison: HIA = 814,000 hits in Yahoo®)
EIA	Environmental IA	6,210,000	Worldwide spread; legal basis, EC directives; systematic procedures to identify, describe and assess impacts; established routines; community of practitioners; strives to consider interaction between factors, and to establish post-decision monitoring activities
SEA	Strategic Environmental Assessment	1,200,000	> Europe-wide spread; legal basis, EC directives; "upstream" orientation ("causes of causes" / policy-related decision-making instead of project-related decision-making; range of impacts incl. secondary, cumulative, synergetic, short- and long-term, permanent or transient, positive and negative
SIA (1)	Social IA	651,000	Broad view of social determinants; Interorganizational Committee on Guidelines and Principles for SIA: „all social and cultural consequences ... of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs, and generally cope ..."
SIA (2)	Sustainability IA	94,700	Environmental sustainability refers to the ability of the functions of the environment to sustain the human ways of life. Socio-cultural sustainability: objective is to secure people's socio-cultural and spiritual needs in an equitable way, with stability in human morality, relationships, and institutions
GIA	Gender IA	49,700	EU Guide on Gender Impact Assessment: objective is to compare and assess, according to gender relevant criteria, the current situation and trend with the expected development resulting from the introduction of the proposed policy
IIA	Integrated IA	34,700	Standardized, wide-ranging and ambitious IA system for policy proposals within EC; strives to analyse both benefits and costs; transparency: all IAs and all opinions of the IA Board on their quality are published online
HEIA, HIIA	Health (In)Equalities IA	11,300	Efforts to identify and analyse health-related (in)equality / (in)equity issues of new initiatives; high-ranking support, e.g. incorporated in the Jakarta Declaration (1997) and called for by the United Kingdom's Independent Inquiry into Inequalities in Health (1998)
HSIA	Health Systems IA	641	Acknowledging that policies may have unintended impacts on health systems, due to their large and complex structures; EC DG Health and Consumers' tool providing information about the objectives and health system functions that a proposal may impact on, either in a positive or negative way
(HTA)	(Health Technology Assessment)	1,790,000	A specialized version of IA dealing with (medical) technologies in health care; typically featuring strong infrastructure incl. dedicated (inter-)national institutions; standardized procedures; focus on "evidence" as assessed by systematic review, evaluation, and integration of scientific literature

HIA 09 Rotterdam: IA Family visiting World Cafe

Box 2: Selected options for "integration", incl. respective pro's and con's

Option A: No integration, Pro: Requires no "extra" effort; strengths of existing IAs are maintained. Con: Risk of duplication of efforts; risk of confusing stakeholders; risk of producing contradictory input into decision-making and other policy contexts which could then contribute to "IA fatigue".

Option B: "Partial" integration, e.g. where EIA or SEA is being performed, integrate "health" into it. Pro: Opportunity to involve stakeholders comprehensively and efficiently; results might be more easily communicated to decision-makers. Con: Difficult to establish "equal footing" of topics, disciplines.

Option C: "Full" integration, cf. EC "integrated approach". Pro: Is "natural" approach since overall (not sectoral) impact is needed for policy-making; easiest to handle for stakeholders. Con: Requires all-round expertise; may be extremely demanding; alternatively, could fall way behind its potential. Existing IA cultures could go extinct without being adequately replaced.

Results / Conclusions: Selected results obtained in this initiative are shown in Boxes 1 & 2. Conclusions include the following:

- Although the list of IAs for which names have been coined is long (and growing), a smaller number of IAs is supported by specific "cultures", e.g. legal basis, political support, legacy of experience, material infrastructure, etc. (A range of rather specific IAs, e.g. Mental Well-being IA and Environmental Health IA was not included here but could provide additional insights.)
- Each of the major IAs has features potentially inspiring for the further development of HIA; so it is clearly beneficial to look at the "IA family" from this perspective
- In contrast, avoiding mutual interference of IAs and the related issue of integrated IAs seem rather hard to come by. All suggestions are welcome.

2011

Prelim recommendations

- Continue the exchange of information, and the joint discussion, within the "family"
- In HIA publications (cf. books currently being prepared; gateways / websites), include chapters on other (health-related) IAs
- Establish ongoing discussion on "family" within emerging HIA development efforts in professional associations, e.g. EUPHA.

The authors wish to thank **Laura Nolte** for her technical support to the „Family" initiative.

Links / references: available from the authors

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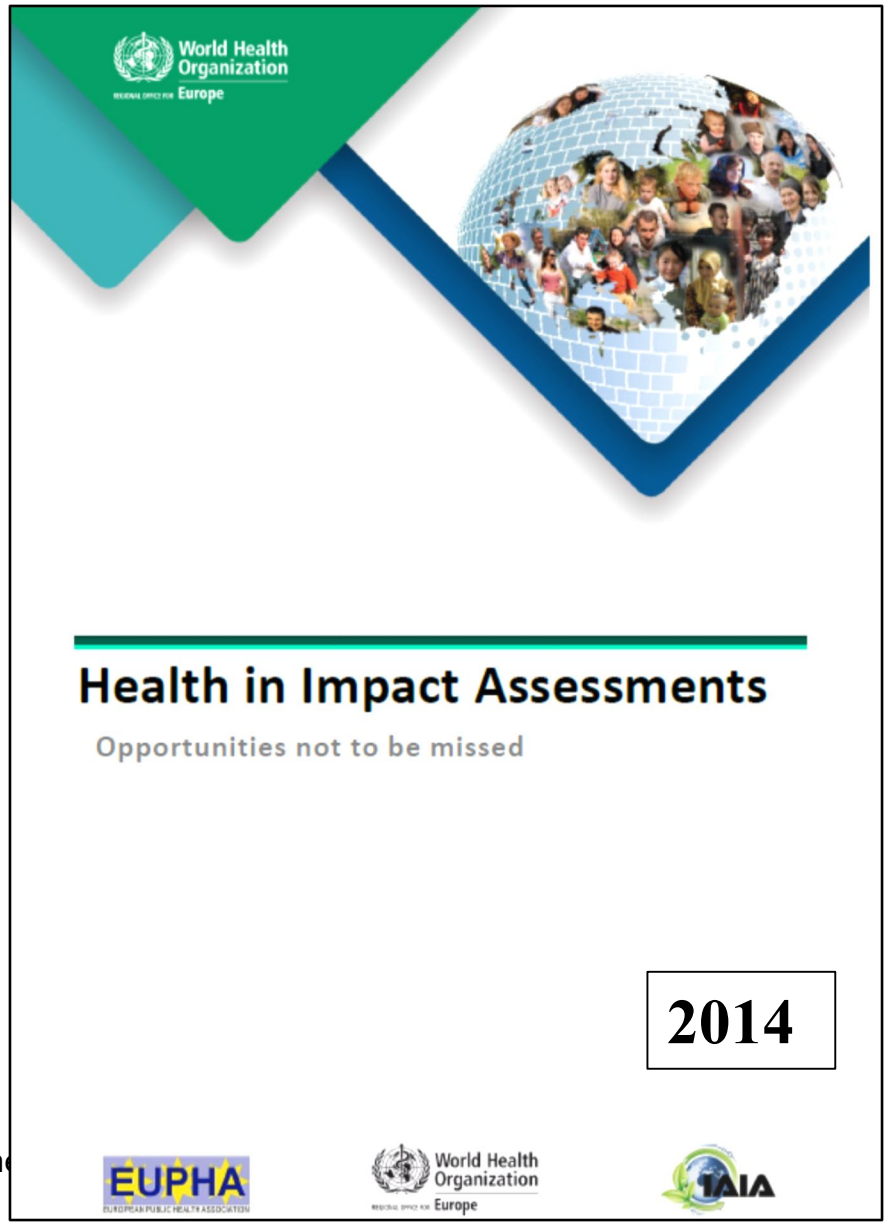
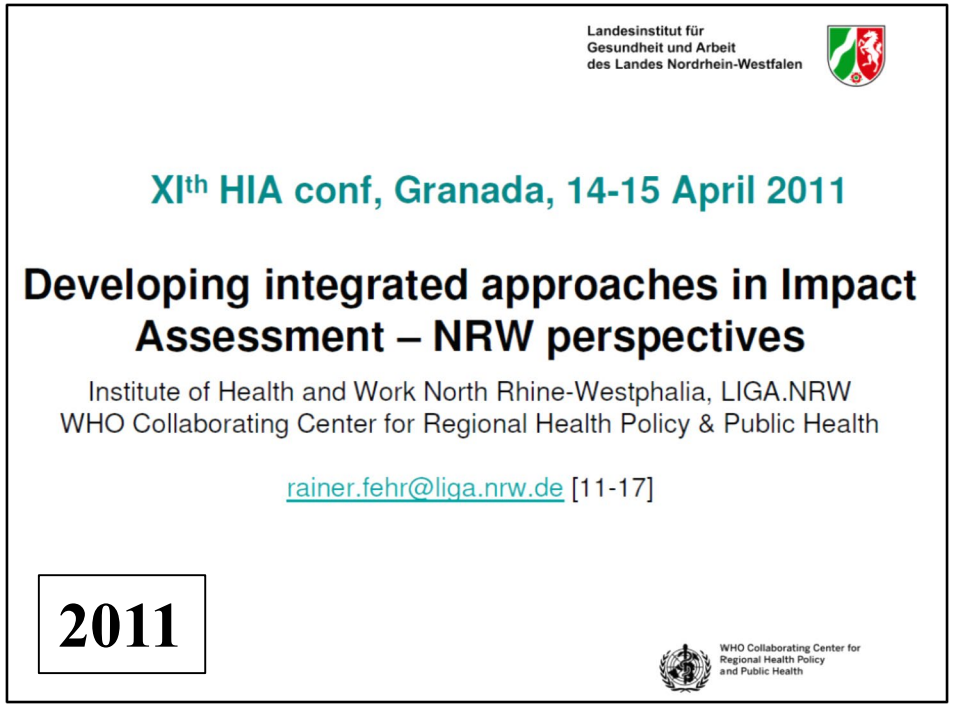
[19_06] "Family of health assessme



Fehr R, Viliani F, Nowacki J, Martuzzi M (eds.) (2014) by WHO-Europe, EUPHA, IAIA:

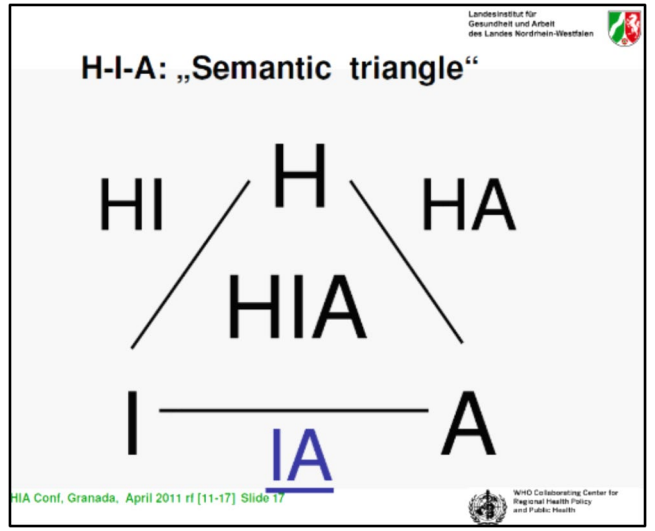
- Health in Environmental Impact Assessment (EIA) in Estonia, Norway, Sweden
- Health in Strategic Environmental Assessment (SEA)
- Sustainability assessment & Health
- Health in Social Impact Assessment (SIA)
- Health Impact Assessment (HIA)
- Enhancing health in Impact Assessments
- Annex: Chronology 2009-2014

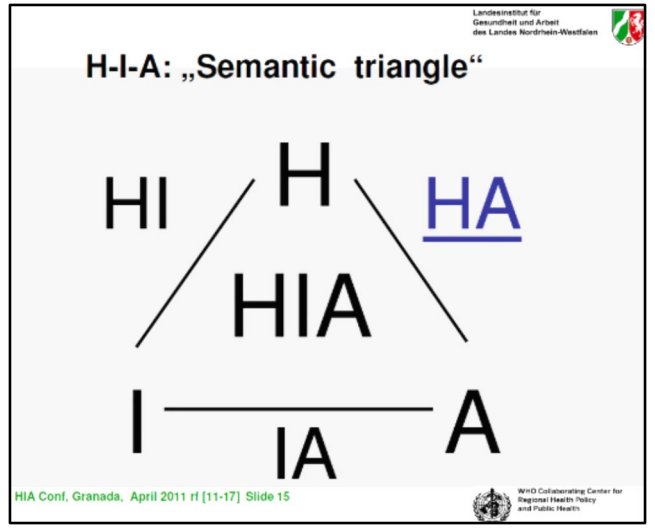
2. Other (health) assessments



"What is in a name?"

- Among the *Impact Assessments*, HIA is the one most strongly focused on health
- Among the *Health Assessments*, HIA is the one focusing on Impact.
  Question: Which are the *other* types of Health Assessment?





Health assessments

A goal was set to develop an integrated view of (governance-supporting) “health assessments”

More recently, this was done by also building on EUPHA’s expertise

Assessment types: Health reporting (Status quo assessment), Health Needs Assessment (HNA), Health Impact Assessment (HIA), Health Technology Assessment (HTA), Health Systems Performance Assessment (HSPA), Programme evaluation, Economic assessment.

Health assessments

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Europ. J Public Health 2017, vol.27, no.4, 609-616

Health assessments for health governance—concepts and methodologies

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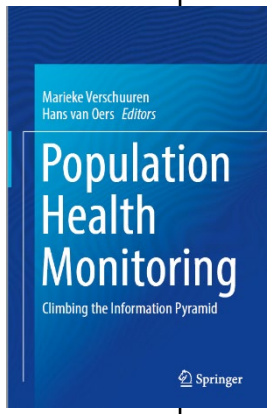
11 European Public Health Association, Utrecht, The Netherlands

2017

[19_06] “Family of health assessments” approach

Chapter 9
Relating Population Health Monitoring to Other Types of Health Assessments

Rainer Fehr and the EUPHA Sections working group on Health Assessments



In: Verschuuren M, Oers H von, (eds.) (2019): Population Health Monitoring – Climbing the Information Pyramid. Springer Nature Switzerland, Cham (CH)

9.1 About This Chapter

While population health monitoring, as presented in this book, qualifies as one key approach to using information and evidence for health policy-making, additional organized approaches are frequently used at the interface of (health) science and (health) governance. This is largely due to the fact that in public health, most of the professic Additional purposes nsiveness, and acc re, public health re overnance for bette ckground, the scie tention in public h licy ques- tions are to answer such que nd inspir- ing com of assess- ments. It covers definitions, goals, procedures, and methods of such assessments, in a comparative way. It outlines practical examples, describes how various assessment types relate to population health monitoring, and sketches current and future

Working group members: Kristina Alexanderson, Carlo Favaretti, Rainer Fehr, Judith de Jong, Giuseppe La Torre, Tek-Ang Lim, Piedad Martín-Olmedo, Odile C.L. Mekel, Kai Michelsen, Nicole Rosenkötter, Marieke Verschuuren, Chiara de Waure and Dineke Zeegers Paget
EUPHA sections involved: Health Impact Assessment, Health Services Research, Health Technology Assessment, Public Health Economics, Public Health Epidemiology, Public Health Monitoring & Reporting, Public Health Practice and Policy

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2019

M. Verschuuren, H. van Oers (eds.), *Population Health Monitoring*,
https://doi.org/10.1007/978-3-319-76562-4_9

Commonalities amon health assessments

These health assessments are meant to inform policy-making and solve “real-world” problems, by organizing “evidence”

Their place is not in research environments, but in society; results often remain unpublished

For each type of assessment, there is a (dynamic) “culture” of traditions, resources, infrastructure

(= presented in more detail in the HIA pre-conference, 20 Nov 2019)

Differences among health assessments

Not surprisingly, there are considerable *differences* among the assessments

Part of these differences is related to the character of each assessment type, e.g. estimation of “future impact” requires other methods than “observation” does

But other differences, apparently, are *not* so deeply rooted, they seem to point to *transferable* features, implying useful *options* (also) for EIA.

3. Options / suggestions for EIA development

Results from the comparative work can be used to connect EIA to other health-related assessments

Options for EIA development, concerning “Methods”

From *HNA*: involvement of target groups via interviews, informal discussions, complaint procedures, health forums, focus groups …

From *HTA*: strong reliance on systematic reviews and meta-analyses

From *Economic analyses*: in addition to traditional indicators (incidence, mortality) also using composite indicators, e.g. DALYs

Options for EIA development, concerning "Institutionalization" and "Resources"

Institutionalization is particularly strong with *HTA*, incl. Network of Agencies for HTA (INAHTA) and European Network for HTA (EUnetHTA)

Resources:

From *(health) reporting*: using a multitude of data sources; defined indictor sets; data presentation and visualization tools, e.g. gapminder

From *HTA*: EUnetHTA's "core model" of doing HTA, and "Horizon scanning"; INAHTA HTA database about ongoing and published HTAs

Options for EIA development, concerning “Infrastructure”

From (health) *reporting* and *HTA*: there are whole sets of WHO collaborating centers

From *HSPA*: there is a (very active) EC expert group; support is given by the European Observ-atory on Health Systems and Policies (Brussels)

4. Further benefits for (E)IA arising from „Family“ perspective; and conclusion

Existing local *health (or environmental) reports* provide baseline information, as required in impact assessments

An existing *HNA* for the study population can point to vulnerable subpopulations – potentially relevant for expected impacts

An existing *HSPA* can reveal specific weaknesses of local health care – same

Existing *ex-post evaluations* of similar projects can inform prospective IA.

Collaboration, Project work, Teaching

Recommendable: close collaboration with institut-ions responsible for (health / environmental) *reporting*, which often have stable connections with stakeholders incl. data providers

The competencies required for “health in EIA” do overlap with those required for other types of health assessments, e.g., *health reporting* or *evaluation* -> joint teaching modules?

Conclusion

The “family” perspective of health assessments promotes systematic exchange and debate across (health) assessments, helping:

- to derive impulses (options) for EIA practice and future development (sect. 3)
- to harness further benefits incl. utilizing (local) information from “other” assessments, and supporting each other (sect. 4)

Thus, we can make best use of existing knowledge and capacities.

Optional addendum

Health Impact Assessment (HIA)

Teil I Grundlagen und Konzepte

- Methods, Procedures
- Role of quantitative risk assessment
- Valuation criteria
- Strategies to resolve conflicts
- Urban planning
- International comparison

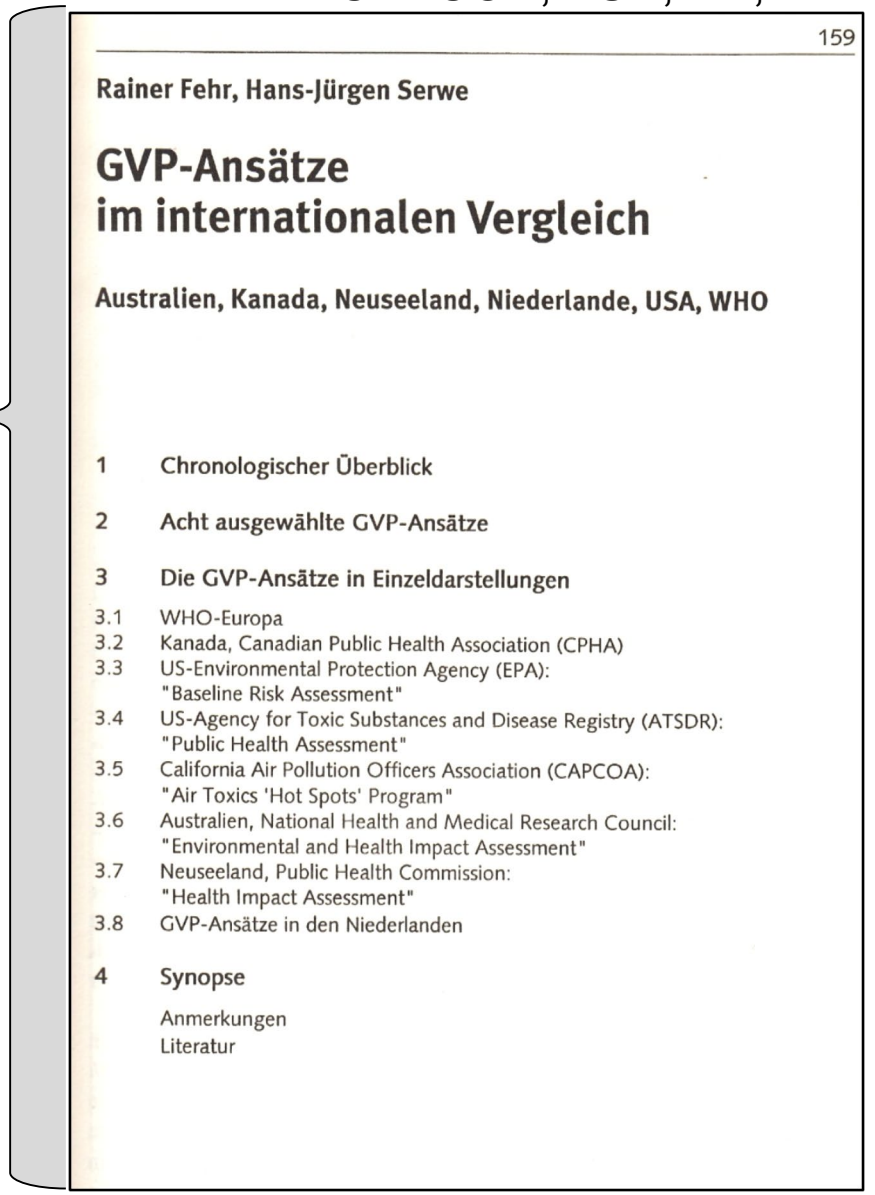
Teil II Praxiserfahrungen

- Waste disposal (dump site expansion)
- Transport (new road)
- Local practice
- Administrative networking
- Cost and benefit

Teil III

- Perspectives
- Ministerial resolution 1992

8 selected approaches: WHO-Europe, CPHA, EPA, ATSDR, CAPCOA, AUS, NZ, NL



159

Rainer Fehr, Hans-Jürgen Serwe

GVP-Ansätze im internationalen Vergleich

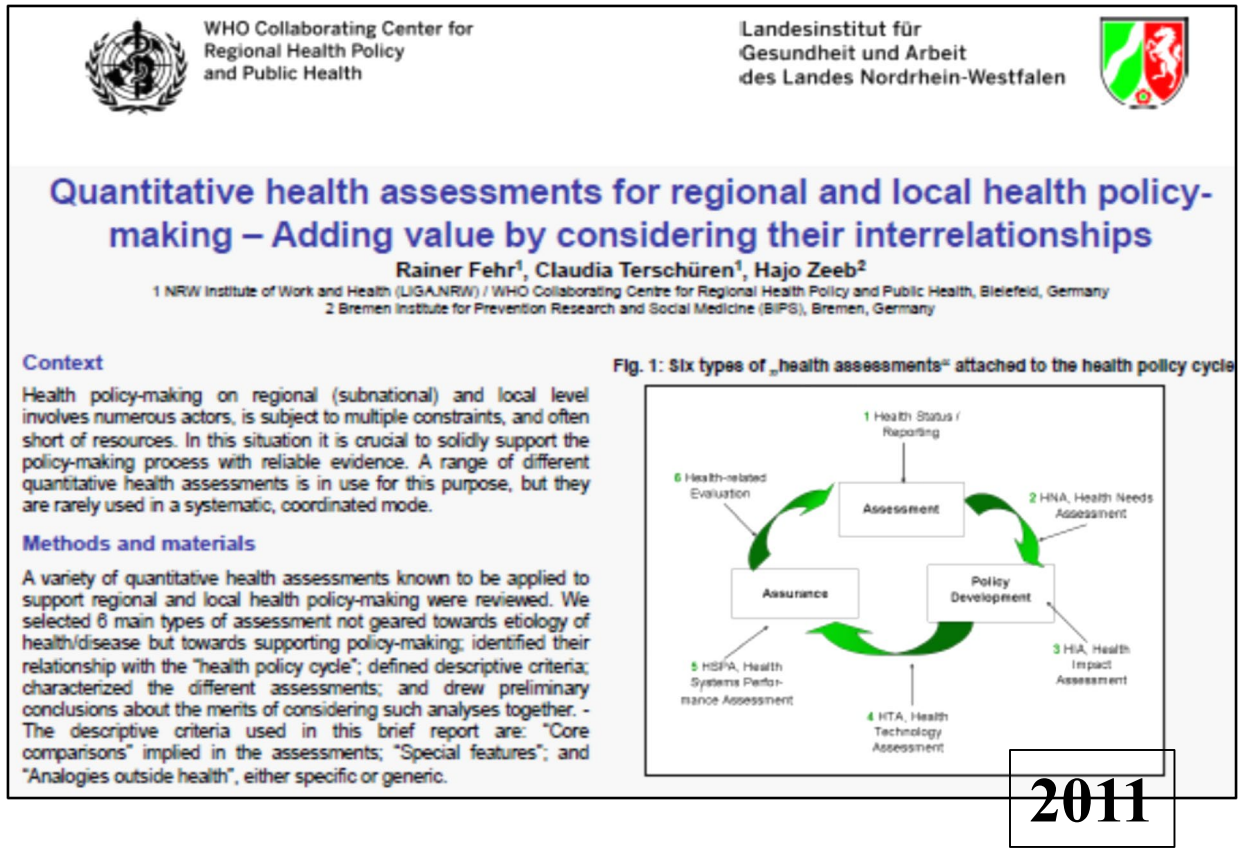
Australien, Kanada, Neuseeland, Niederlande, USA, WHO

2004

European Policy Health Impact Assessment (EPHIA) project

- HIA of the European Employment Strategy (EES): across the European Union / in Ireland / the Netherlands / Germany / United Kingdom
- HIA: un guide / a guide / en Leidraad / Empfehlung zum Vorgehen

Health assessments



WHO Collaborating Center for Regional Health Policy and Public Health

Landesinstitut für Gesundheit und Arbeit des Landes Nordrhein-Westfalen

Quantitative health assessments for regional and local health policy-making – Adding value by considering their interrelationships

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Context

Health policy-making on regional (subnational) and local level involves numerous actors, is subject to multiple constraints, and often short of resources. In this situation it is crucial to solidly support the policy-making process with reliable evidence. A range of different quantitative health assessments is in use for this purpose, but they are rarely used in a systematic, coordinated mode.

Methods and materials

A variety of quantitative health assessments known to be applied to support regional and local health policy-making were reviewed. We selected 6 main types of assessment not geared towards etiology of health/disease but towards supporting policy-making; identified their relationship with the "health policy cycle"; defined descriptive criteria; characterized the different assessments; and drew preliminary conclusions about the merits of considering such analyses together. - The descriptive criteria used in this brief report are: "Core comparisons" implied in the assessments; "Special features"; and "Analogies outside health", either specific or generic.

Fig. 1: Six types of „health assessments" attached to the health policy cycle

2011

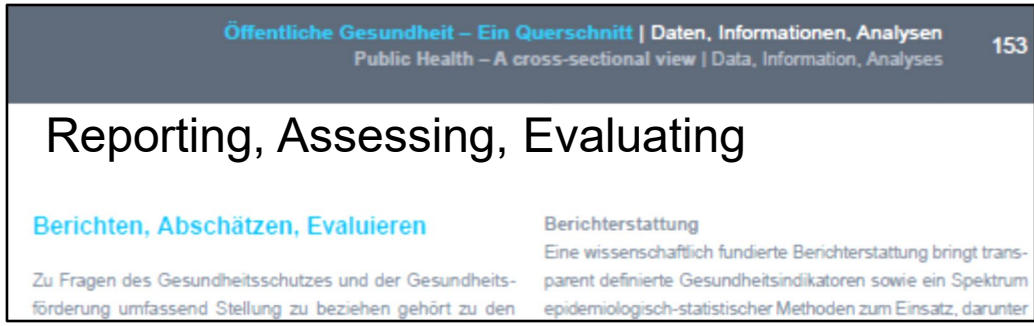
Landeszentrum Gesundheit Nordrhein-Westfalen

1969 1979 1980 1990 2000 2010 2020

2012

Im Dienst der Öffentlichen Gesundheit
Fostering Public Health

Entwicklungslinien von den hygienisch-bakteriologischen Untersuchungs-ämtern bis zum Landeszentrum Gesundheit NRW
Trends of development from State Laboratories for Hygiene to the NRW Centre for Health



Reporting, Assessing, Evaluating

Berichten, Abschätzen, Evaluieren

Zu Fragen des Gesundheitsschutzes und der Gesundheits-förderung umfassend Stellung zu beziehen gehört zu den

Berichterstattung

Eine wissenschaftlich fundierte Berichterstattung bringt trans-parent definierte Gesundheitsindikatoren sowie ein Spektrum epidemiologisch-statistischer Methoden zum Einsatz, darunter

[19_06] "Family of health assessments" approach

Health impact quantification

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Health impact assessment – A survey on quantifying tools

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ABSTRACT

Integrating human health into pr
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2016

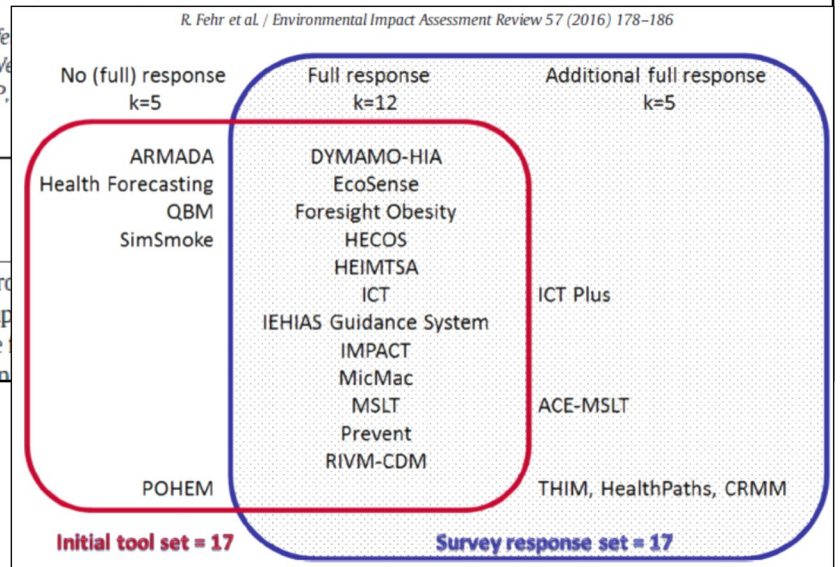
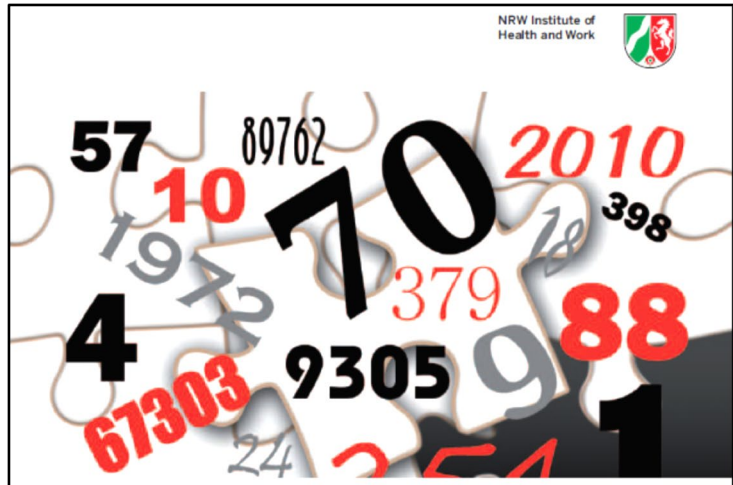


Fig. 1. Initial tool set, and tool set covered by the response to the survey (2013).



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