

# Project plan

## AMSTERDAM PUBLIC HEALTH

Academic Research Institute  
within the  
VUmc/AMC and VU/UvA alliances

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# Amsterdam Public Health

# 1. Mission, Vision, and Core Values

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## Mission

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Our mission is to conduct high quality research to improve citizen health, reduce health inequalities, transform healthcare, and empower citizens.

Health and healthcare are undergoing major transformations<sup>1</sup> with rapidly changing expectations of citizens. The Amsterdam Public Health research institute will generate, disseminate, and translate knowledge, based on sound research to:

1. help decision-makers at all levels to assess health needs, create a healthy environment, strengthen the healthcare system and safeguard its sustainability,
2. assist healthcare professionals in maintaining and improving their performance, and
3. empower patients and citizens in managing their health.

'Public Health' refers to all organized measures (whether public or private) to prevent disease, promote health and participation, and prolong (quality of) life among the population as a whole and specific subgroups. Its activities aim to provide conditions in which people can be healthy. The focus is both on entire populations and individual patients or diseases.  
Adapted from WHO, 2015

The Amsterdam Public Health research institute researches 'Public Health' issues (see box) with immediate relevance for the societal challenges facing large metropolitan area's in a globalizing world. These include the shifts of health care from the national to the municipal level and from in-hospital to extramural care settings (figure 1).

## Vision

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The Amsterdam Public Health research institute will become a European center of excellence for generating knowledge on contemporary issues in primary care and public health settings through multi- and interdisciplinary research on risk and protective factors, on effective prevention and intervention, and on policies and practice. We envision to be ranked among the major European institutes of Public Health.

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<sup>1</sup> *Zichtbaar zinnige en zuinige zorg* Vervolgadvies van de NFU aan de minister van VWS, 2014; *Naar nieuwe zorg en zorgberoepen: de contouren* Advies van de Commissie Innovatie Zorgberoepen en Opleidingen, Zorginstituut Nederland aan de minister van VWS; *Innoveren voor gezondheid – technologische en sociale vernieuwing in preventie en zorg* TNO Strategy&Change, 2013

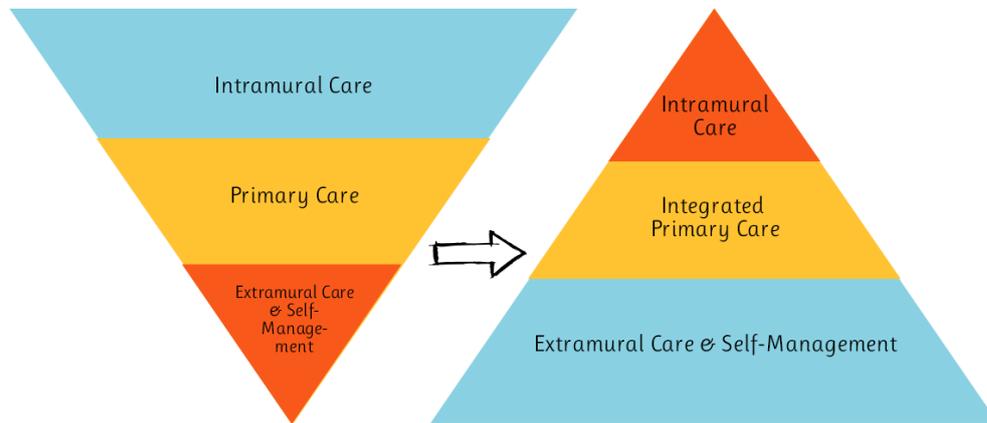


Figure 1 - Contours of a changing health care system

Strategically, we will focus our research in the next years on health behaviors and chronic diseases, mental health, societal participation and health, global health, aging and later life, quality of care, personalized medicine, and methodology.

We build on the excellent reputation that AMC and VUmc/VU (EMGO<sup>+</sup>) have in research on these topics and the clear synergy derived from merging two healthy communities of researchers with complementary skills. The research institute is fully integrated in the two Amsterdam universities and has strong ties with partners in research and practice in our environment. It communicates effectively with all stakeholders, its research is highly cited by academic colleagues and used by decision makers and healthcare professionals to improve health, reduce health inequalities, transform healthcare, and empower citizens.

The Amsterdam Public Health research institute will in time grow into the Amsterdam School of Public Health, a single organization combining knowledge generation and dissemination, and the training of future health care professionals in an academic environment, thus contributing to responsible innovation in health and health care.

## Core Values<sup>2</sup>

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- We feel a strong personal engagement in advancing the health of *all* citizens, respecting social, ethnic and cultural diversity.
- We aim for excellence, openness, and integrity in everything we do.
- We base our scientific efforts on their clinical and societal relevance.
- We are a responsible and competent partner in innovation and capacity building with public health practitioners, healthcare professionals, policy makers, and communities in our environment.

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<sup>2</sup> Reflecting the core values of the founders: VU (being responsible, open and personally engaged), UvA (innovation, determination, engagement), Vumc (engagement, carefulness, ambition), AMC (engagement, continuous improvement, competence, integrity).

## 2. Research Programs

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The Amsterdam Public Health research institute will concentrate its research efforts in eight research programs that are well-aligned with the Dutch National Science Agenda.

### The Dutch National Science Agenda (NWA)

*A coalition of knowledge institutes has crafted a National Science Agenda (NWA) to deploy research resources and efforts in the major academic strengths, societal issues and economic opportunities in the Netherlands. This science agenda will become final in 2016 and will be renewed once every seven years. The NWA aims to further strengthen the top position of Dutch research by providing direction in research, by connecting and consolidating existing strengths and by translating research outcome into policies. Routes have been defined that include several topics which form coherent themes consisting of an underlying collection of related research questions. The Amsterdam Public Health Research Institute can contribute significantly to at least eight of the 25 prioritized routes: "The individual, his environment, health and illness: attention for variation"; "towards resilient societies: a future-proof Netherlands"; "Sport and movement"; "Personalized Medicine"; "Resilient and Fulfilling Societies"; "Assessable and responsible Use of Big Data"; "Smart, Liveable Cities" & "Sustainable Production of Safe and Healthy Food".*

In these programs, around 1,300 researchers are brought together in total with around 500 PhD students. The programs and their major themes of research are:

### I. Health Behaviors & Chronic Diseases

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#### Background

Behavior-related chronic diseases such as obesity, diabetes, cardiovascular diseases, cancer and depression account for most of the burden of disease in high income countries. These diseases are attributable to unhealthy behaviors, such as smoking, physical inactivity, excessive sedentary behavior, and unhealthy dietary behavior. These health behaviors are not only the result of individual free choices. Instead, health behavior is to some extent enforced by the environment (e.g. economic, physical and socio-cultural), through aspects such as material deprivation, living conditions and culture.

The aim of research within the theme Health Behaviors & Chronic Diseases is to examine patterns of health behaviors, genomic and environmental determinants of these behaviors as well as their impact on chronic diseases and functioning; and to develop and evaluate interventions to promote healthy behavior with the aim of reducing chronic disease morbidity and mortality and improve quality of life. The health behaviors covered by these research activities include smoking, alcohol use, physical activity, sedentary behavior, sleep and dietary behavior.

Starting point of all research is recognition of the fact that health behaviors are embedded in the conditions in which people are born, grow up, live, work and age, but also bear an individual component. Specific attention is given to high risk groups, including ethnic minority populations. This research is conducted in a variety of populations (e.g. children, older adults, and diabetes and cancer patients) and a variety of settings including primary care, communities, nursing homes, schools and workplaces. The multifactorial etiology, covering biological, psychological and social factors, requires the employment of a broad range of disciplines, including medical and social sciences.

## Themes

*Etiology and prevention of chronic diseases, such as diabetes, cardiovascular disease and cancer.* This theme includes: (1) epidemiological studies on the variation in, and consequences of, amongst others, diabetes, cardiovascular disease and cancer; (2) the study of biological, genetic, environmental and behavioral determinants of these chronic diseases and their potential interrelations.

*Measurement, surveillance and determinants of health behaviors, in particular smoking, alcohol use, physical activity and sedentary behavior, dietary behavior and sleep.* This theme includes: (1) adequate measurement of health behaviors and their determinants; and (2) epidemiological studies on biological, genetic, environmental and individual determinants of health behaviors and their potential interactions.

*Interventions promoting healthy behavior and prevention and management of chronic diseases.* This theme includes the evidence and theory based development, implementation and evaluation of: (1) a broad range of interventions, including e-health and m-health, to promote the above mentioned health behaviors, taking into account the environment in which behavior is embedded; and (2) interventions for prevention and management of chronic diseases such as exercise rehabilitation in cancer survivors and personalized interventions.

## Partners

The researchers within this theme are based in a broad range of departments of the VU(MC) and AMC, including public health, general practice, psychology, epidemiology, health and nutrition, cardiology, and psychiatry. Each of these departments have strong collaborations with other academic research groups within the Netherlands and abroad, promoting the quality of their research within both the etiological and intervention studies. Within the third theme (interventions), we have strong collaborations with organizations that implement health promoting measures, including the Municipal Health Service Amsterdam (academic collaborative center Child and Health, Sarphati Initiative, Sarphati Amsterdam), GP and other primary care practices such as dietetics and physiotherapists, and health care insurers. We expect the Amsterdam Public Health research institute to facilitate further collaboration with both academic and societal partners.

## Relation to other research programs within APH

This theme is closely related to many other research programs within the Amsterdam Public Health research institute. To increase the potential for synergy and innovation of research, we will actively promote collaboration with other research programs within the Amsterdam Public Health Research Institute such as Methodology, Mental Health, Quality of Care, Personalized Medicine, and Aging & Later Life. For example, quantitative methods to efficiently analyze data from cohort studies or big data are of common interest. Moreover, the development of interventions to promote healthy behavior will complement interventions developed in health care for those who suffer from chronic diseases or in the work setting, which provides opportunities to collaborate with the themes Quality of Care', Personalized Medicine and Societal Participation & Health.

## II. Mental Health

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### Background

It is undisputed that there is no health without mental health, encompassing the wide spectrum from mental well-being to mental health problems. Mental health problems such as depressive disorders, anxiety, and alcohol use disorders are common in the general population; they rank among the conditions with the largest disease burden worldwide. Mental health conditions impact not only on individuals' wellbeing and quality of life, but also on their somatic health, health care utilization and daily (work) functioning. Therefore, these conditions have a profound impact on the society as a whole.

Mental health conditions are considered complex diseases, with multiple risk factors involved in their etiology: genetics, psychosocial and environmental stressors, brain abnormalities, personality and coping strategies and somatic conditions. Consequently, to more completely understand the causes and consequences of mental health problems, a multidisciplinary approach is needed. This multidisciplinary approach provides excellent opportunities to learn more about the etiology, course and consequences of mental disorders such as depression and anxiety disorders, addictive or disruptive disorders and psychotic disorders. It also allows for cross-disorder research by exploring underlying shared and unique vulnerabilities.

To understand the entire spectrum of mental health, the Mental Health program will not only examine the development of (chronic) mental disorders, but will also encompass mental well-being and quality of life. Such a wide focus will provide insight into resilience factors that prevent mental ill-health, and will provide us with new keys for preventive strategies of mental health problems. A strong focus in our program will also be the development of better interventions to improve health among those with mental health problems. It is well known that the currently available treatments work, but not for all. Developing personalized medicine approaches, in which we better target existing or new treatments based on patient profiles, is an important focus for the next decade of mental health research.

### Themes

#### *Etiology, development and consequences of mental health*

This theme includes epidemiological, observational research either in the community setting, the general practice setting and/or the psychiatric care setting. Within the Mental Health program, we have a rich source of large-scale community and/or patient cohorts covering the entire lifespan. Using these rich research infrastructures, this research line will increase our evidence-base for the occurrence, determinants and consequences of mental disorders. The objectives are to investigate: (1) genetic, clinical, psychosocial and environmental factors that contribute to mental well-being and the development of mental disorders; (2) the chronicity, staging and profiling of disorders; and (3) the impact of mental disorders on the individual patient, the patient's social environment as well as the society at large.

### *Prevention and treatment of mental health problems*

This theme encompasses research that contributes to evidence-based information on innovative prevention and treatment interventions to improve mental health and reduce associated disability. This research line also uses insights from observational studies, but will mainly provide new insights through the conduct of various intervention studies (randomized clinical trials). These intervention studies are applied in the general population, primary care, mental healthcare and somatic healthcare settings. Studies are aimed at evaluating psychotherapeutic or psychotropic interventions as well as other emerging interventions, e.g. e-mental health interventions over the internet or mobile phone, stepped care interventions, running therapy, light-therapy and nutritional interventions.

### *Soma & Psyche*

The research theme Soma & Psyche aims to facilitate research on the interface between mental health and somatic disease. It includes mental disorders as well as common mental reactions to somatic diseases, such as anxiety, hope, and growth. Mental disorders are highly prevalent in patients with somatic diseases and, vice versa, psychiatric patients frequently have or develop coexisting somatic diseases. The studies investigate (1) mental health, mental disorders and quality of life in persons with various somatic diseases; (2) (underlying reasons for) increased somatic health problems in persons with psychiatric disorders; (3) specific conditions at the interface of soma & psyche such as chronic pain and somatoform symptoms and disorders; and (4) effects of specific intervention programs targeting combined somatic and mental health problems. This theme connects strongly to intramural research.

### **Partners**

VU(mc) and AMC researchers within the Mental Health program come from different backgrounds: psychology, orthopedagogy, psychiatry, genetics, general practice, elderly care medicine, a range of other medical specialties, health sciences, epidemiology and biostatistics. We have strong collaborations with the mental health care organizations of the Municipal Health Services (GGD) Amsterdam, GGZ inGeest, Prezens, Arkin and De Bascule, where various academic collaborative centers have been formulated (e.g. academic collaborative center for depression, anxiety, bipolar disorder, psychiatry for elderly, late-life depression). In the area of Soma & Psyche we will collaborate with partners in the emerging structures for psychosocial care in somatic diseases. In the near future, we will explore additional synergy with our UvA partners (e.g. psychology groups).

### **Relation to other research programs within APH**

The Mental Health program will closely collaborate with other research programs within Amsterdam Public Health. For instance, we have direct links with the theme Aging & Later Life, specifically with respect to the topics resilience, vulnerability and quality of life. We will work closely with the theme Personalized Medicine to develop risk profiling and predict mental health outcomes. We will also develop and evaluate stratified or personalized interventions, based on personal background, including genetic characteristics. In collaboration with the Quality of Care program we will develop reliable and valid person-specific outcome measures for mental health. With the Health Behaviors & Chronic Diseases program we will collaborate around lifestyle

interventions and mental health impact. We will additionally collaborate with the research program Methodology, to fine-tune existing and develop new outcome measures, to link data from different sources and to model and interpret data across multiple levels of measurement.

### III. Societal Participation & Health

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#### Background

The increasing number of people with chronic diseases in the Netherlands originates in epidemiological and demographic changes: a growing number of (young) people suffering from such diseases, of which a substantial part is lifestyle related, in an aging population. Consequently, full societal participation is becoming increasingly problematic for many people, warranting pragmatic, evidence-based solutions. Full societal participation is defined as the opportunity for individuals to optimally participate in as many social roles as desired. Such social roles not only involve paid work, but also voluntary work, informal care and in other forms of social activities in society.

Government policies increasingly stimulate informal care within families and other social groups, and also more self-management of people with chronic health problems. This has major impact on individuals, resulting in more responsibilities on top of those in their own working and private life. Prevention of disabilities or disorders, and related sickness absence, work disability and (temporary) unemployment, is required, because of the large impact on the individual and on the society.

The purpose of research in this program is to help maintain and further improve societal participation of people with and without health problems. The alliance of VUmc and AMC research groups provides synergy and increases the chance of becoming the number 1 in the Netherlands and Europe regarding research on 'lifelong participation, for everyone, everywhere'.

#### Themes

##### *Participation of people with chronic disease*

The aim is to prevent unemployment and to improve societal participation in patients with a chronic disease or with chronic health complaints. The development and evaluation of evidence-based interventions to support employment, (re-)integration and functioning in both paid and unpaid work is an important focus within this theme of research. Many (chronic) diseases/disorders are already subject of research; we study cancer survivors and patients with chronic fatigue, musculoskeletal symptoms, rheumatism, skin and hearing disorders, acquired brain injuries, and those with mental illness. Research is being conducted in close collaboration with the curative and occupational health care sector, but also with the Dutch Social Security Agency, private insurers, and municipalities. The focus is on people with a wish to participate or to return to their normal activities, such as work despite their (chronic) health condition. Research addresses the value and meaning of societal participation of these groups of people and their needs from health care professionals, including occupational and insurance physicians.

### *Informal care and other forms of participation in society*

Informal care is crucial for a healthy society in which people take care of each other. With the increase of participation in competitive work in the last few decades, other forms of societal participation are often an addition leading to a higher risk of health complaints due to the increased load for individuals. We anticipate that informal care will further increase within the next years due to governmental policies, justifying the relevance for research on this theme and exploring new ways for a healthy combination of paid and voluntary work, including informal care.

With the increase of the statutory retirement age, older workers are forced to postpone their retirement date. Insight into determinants of (early) exit from work, and prolonged participation in paid and unpaid work is required to develop interventions to better support older workers towards their retirement. Another recent development concerns delayed retirement, in which older workers continue to work after they have retired, i.e. bridge employment. As both in the Netherlands and in Europe many large datasets are available, this theme offers ample opportunities for international collaboration.

### *Health behavior and medical examinations*

This theme concerns research on the promotion of health behaviors in employees and on medical examinations and guidance of workers. It focuses on health behaviors in the domain of lifestyle, profession, and leisure activities that influence risk factors for cardiovascular diseases, musculoskeletal disorders, and stress-related diseases. A healthy lifestyle is crucial for societal participation and healthy aging. Knowledge of determinants is the focus here. Determinants of health behavior will be translated into instruments and intervention programs, which will be evaluated in large trials in real world settings. A particular focus is put on the emerging topic of sedentary behavior, both at work and at home, which has been shown to be associated with all-cause mortality, independent of physical activity. A second focus is on the enhancement of the quality of workers' medical examinations (pre-employment and on-employment) and medical guidance with respect to their sustainable work ability in general and specifically in high-demands jobs. A third focus is on the scientific evaluation of instruments and tools to assess work (dis)ability, functional abilities and anticipated recovery to participate in work contexts. An important topic for insurance physicians in both public and private contexts is research on the quality of their medical assessments, e.g. performed to evaluate eligibility for sickness and work disability benefits.

### *Etiology and prevention of work-related disorders*

In this theme research related to the etiology and prevention of work-related disorders and occupational diseases is addressed. It focuses on work-related factors, such as infectious/allergic/toxic agents, manual materials handling, computer work, work stress, shift work, or bullying at work, which may cause work-related disorders and occupational diseases. Criteria guidelines for assessment of the work-relatedness of diseases are developed. The effectiveness of measures to prevent or decrease work-related disorders is investigated. Examples of disorders being studied are occupational dermatitis in hair dressers or health care personnel, and fatigue and metabolic disorders in shift workers.

### *Multidisciplinary and top-referent care for complex work-related disorders*

The expertise and collaboration of medical specialists and occupational physicians is used in the diagnosis, treatment and prognosis for societal participation in case of complex work-related disorders. The development and evaluation of the effectiveness of these integrated care programs, also using various forms of e-health solutions, aimed at improving functional recovery and return to normal daily activities are the focus in this theme. Our research is of great added value to traditional hospital care in providing better patient-reported outcome measures, facilitating communication between different stakeholders and integrating clinical & occupational health care. Research within this theme is being conducted in co-operation with occupational health services, GIOCA (AMC), the departments of Rehabilitation, Rheumatology, ENT & Audiology, Cardiology, Gynecology, Surgery, Psychiatry, and Dermatology.

### **Partners**

To increase the potential for synergy and innovation of research, an active network of researchers and an innovation platform will be established to facilitate and encourage collaboration with the other research programs within the Amsterdam Public Health research institute such as Quality of Care, Personalized Medicine, and Aging & Later Life. We will continue and encourage further collaboration with other alliance research institutes, such as Oncology, Cardiovascular disease, and MoveMed. We will operate within our existing network of academic collaborative centers, and other stakeholders and partners, such as companies (Tata Steel), Occupational Health and Safety Providers (ArboNed, Arbo Unie, KLM Health Services, Stigas, VU/VUmc/AMC arbodienst), the Social Security Agency (UWV), municipality (Amsterdam) and also (semi-)governmental applied research institutes (e.g. TNO, RIVM, and NIVEL). We liaise with family practitioners, clinicians and other health care professionals. The research is conducted within and in co-operation with various sectors (construction, transport, household waste, defense, government, police, firefighting, health care, rehabilitation services).

## **IV. Global Health**

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### **Background**

Global health is the health of populations in a global context; it involves "the area of study, research and practice that places a priority on improving health and achieving equity in health for all people worldwide". Global health is about worldwide health improvement, reduction of disparities, and protection against global threats that disregard national borders. Historically infectious diseases like HIV, tuberculosis and malaria have been a major focus. Increasingly non-communicable diseases (NCDs), maternal health, environmental determinants such as climate change and conflicts and migration are asking for attention, as well as the intersection between infectious diseases and NCDs, in particular in the context of aging. The quality of the health systems, functioning of disease-specific control programs, evidence-based interventions, the use of new technologies and adaptation of those to the local context are important cross-cutting topics.

Global health research often involves an inter- and transdisciplinary approach. The Global Health program within the Amsterdam Public Health research institute uniquely combines researchers and global health practitioners from different backgrounds like clinical and laboratory medicine, public health, epidemiology, health informatics, social

sciences, innovation studies, anthropology, biomedical sciences and mathematical modeling. These researchers and practitioners have a strong tradition in global health research, thereby supporting health systems development by supporting policy advice and developing international recommendations.

The Global Health program aims to contribute to health for all in a global context through research collaboration that foster interaction between theory, policy and practice. Main research themes are given below.

## Themes

### *Urbanization, Migration & Environmental health*

For the first time in human history more than 50% of the world's population lives in urban centers. The number is projected to increase to 70% by 2050. This comes with many health challenges, including environment degradation, violence and injury, non-communicable diseases driven mainly by unhealthy diets and physical inactivity, harmful use of alcohol, as well as the risks associated with disease outbreaks.

Increasingly health problems that are attributed to urbanization affect rural areas as well. Urbanization is intrinsically linked to human migration. It is estimated that there are 1 billion migrants in the world today of whom 214 million international migrants and 740 million internal migrants. The collective health needs and implications of this sizeable population are huge. Migration flows comprise a wide range of populations e.g. migrant workers, refugees, and undocumented migrants, each with different health determinants, needs and levels of vulnerability. This research theme focuses on the role of urbanization on health in low-resource settings, and the vulnerable migrant populations globally, including high-income countries.

### *Sexual, Reproductive & Child Health*

In spite of the progress achieved over the past 15 years, indicators for maternal and child health, specifically for adolescent mothers and newborns, still remain behind in many low and middle-income countries, particularly in sub-Saharan Africa. Morbidity and mortality of mothers as the result of complications during pregnancy, childbirth or soon afterwards are still common in poor communities. Children are at greater risk of dying before the age of five if they are born in poor households, rural areas or to a mother without basic education. More than half of under-five child deaths are due to diseases that are preventable and treatable through simple, affordable interventions. This research theme focusses on key issues that affect maternal health and the health of the early life including poverty, malnutrition, low education and poor access to healthcare services. Sexual and reproductive health and rights (SRHR) is the concept of human rights applied to sexuality and reproduction and is the #1 priority within the Dutch Foreign Aid research agenda and also high on many international agendas.

### *Communicable Diseases & NCDs*

In the past few decades the global pattern of chronic disease burden is shifting. While infectious diseases still remain a major problem in most low-and middle-income countries, chronic diseases, including non-communicable conditions such as cardiovascular diseases, cancer and diabetes are now major causes of death and disability in LMIC as well as high-income countries. In addition, there is a paradigm shift for many infectious diseases from control to elimination/eradication strategies. The nature and control of communicable diseases, including challenges of antimicrobial resistance, make that specific attention is warranted despite obvious

relation with other topics in the global health theme. This research theme focuses on surveillance, disease program evaluations, transmission models, antimicrobial resistance, and preventive strategies of major as well as neglected communicable diseases. Research on non-communicable diseases and mental health within this theme will focus on burden and determinants of disease.

#### *Health Systems Strengthening & Governance*

Health systems strengthening is, according to WHO, the process of identifying and implementing the changes in policy and practice in a country's health system in such a way that the countries can respond better to its health and health system challenges; and any array of initiatives and strategies that improves one or more of the functions of the health system resulting to better health through improvements in access, coverage, quality, or efficiency. The health systems encompass many subsystems including human resources, information systems, health finance and health governance, all of which can be weakened by different types of constraints. This research theme focusses on health systems strengthening particularly in low-resource settings to improve universal health coverage. Research will focus on health information systems, evaluation of innovative prevention, care and treatment models, including use of technologies such as m-health, access to affordable drugs, various financing models, human resource management and laboratory/research capacities. Research questions will also include assessing the efficacy and functioning of different governance and accountability structures, including consumer/community involvement.

#### **Partners**

The program aims to increase collaborations between academia, other research institutions, and implementing organizations in the Amsterdam region and in developing nations. This provides opportunity to increase involvement of methodological expertise in e.g. epidemiology and biostatistics in global health research. In addition to researchers from more than 10 different departments within AMC/UvA and VUmc/EMGO<sup>+</sup>, researchers of the following institutions have already indicated their interest in participating in the Amsterdam Public Health research institute: Amsterdam Institute Global Health & Disease (AIGHD), KIT Health, GGD Amsterdam, PharmAccess, Amsterdam Health & Technology Institute (AHTI) and Equator Foundation. Further collaboration with implementing organizations will be sought in the future.

#### **Relation to other research programs within APH**

Among the researchers participating in the Global Health program are participants in other Public Health programs including Quality of Care and Methodology, and participants in various AMC/VUmc research institutes, especially Infection & Immunity.

## **V. Aging & Later Life**

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### **Background**

Modern societies are facing impressive sociodemographic transitions. On the one hand fertility rates have fallen; on the other hand life expectancy has increased. As a combined effect of these two trends, Western societies are currently aging and the

total dependency ratio is decreasing. These developments concern all of us and will affect many aspects of our lives: aging is the reality of the future world, posing enormous challenges to society, to medicine, and to the health care system as a whole.

On a societal level we not only witness a rise in the number of people who age successfully and continue to enjoy a good health and functional autonomy up until their eighties, we also face an increasing number of older adults suffering from chronic disease, multi-morbidity, disabilities, care dependency, loneliness and related loss of quality of life. In between these extremes, several different profiles can be distinguished, depending on burden of disease, level of functioning and care demands. This heterogeneity calls for new policies. In order to enable older persons to (continue to) live independently, investments are also needed in our built-environment, in our urban planning, design of houses, public transport, shopping, and other areas. With regard to (health care) research priorities, the challenge of an aging population calls for investments in solid research into the determinants of the heterogeneity of aging, as well as in research into the development of interventions that help promote independent functioning, prevent or compensate disability, and foster participation.

Focusing on resilience as an alternative to the prevailing loss-oriented focus of aging research may offer viable alternative research pathways towards a more nuanced understanding of the aging process. The heterogeneity of the elderly population also calls for a move, away from a (single-) disease-oriented approach, toward more tailored and person-centered approaches in research, treatment and care interventions, especially in the final years of life, when quality of life and well-being become more important as goals of care than life prolongation. To respond to the dilemmas posed by a shrinking workforce in the care sector, and the need to support older persons and their informal caregivers, we also need close collaboration between science, technology and industry; we have to design, test and implement innovative care solutions in the fields of e-health, assistive technology and robotics. Overall, since person-preferences are of major importance for interventions and policies to be effective in contributing to quality of life, it is of the utmost importance that older persons play an active part in policy development and in research agenda setting. It is paramount to give a voice, not only to those who represent the profile of healthy and active aging, but also to representatives of more vulnerable groups of older persons.

Responding to these transitions and challenges, our program group sees it as its primary task to understand health changes in later life, taking into account both interacting medical conditions, physical functioning, and well-being, and – based on this understanding – to design and implement preventive, treatment and care strategies to improve quality of life, functioning and participation of older persons throughout the aging trajectory. Related ethical questions about the normative aspects of different views on what constitutes good old age, on the limits of prevention and participation, and on the balance between prolonging life and maintaining wellbeing, are an integral part of this program.

## Themes

### *Person-centered approaches to morbidity and functioning*

Current health care faces two major challenges. (1) Managing persons with (complex) multi-morbidity is much more complicated than managing persons with a single

condition. (2) Most clinical guidelines address single diseases and do not (always) provide guidance for persons with (complex) multi-morbidity. These challenges emphasize the need for a person-centered and holistic approach, one that incorporates interacting and clustering effects on the one hand and personal preferences on the other. This theme encourages researchers to address issues of multi-morbidity – including cognitive dysfunction and falls – functional impairment – such as sensory deficits and mobility problems – polypharmacy, atypical presentation, personal preferences and other interacting components. They must be addressed both in observational and in intervention studies, using a broad, person-centered and multidisciplinary approach. This topic also includes the development of adequate and appropriate diagnostic tools that quantify functioning in a certain domain (such as auditory communication) and disentanglement between several (age-related) interacting effects.

#### *Resilience and vulnerability*

The concept of resilience – loosely defined as ‘the capacity for adaptation and bouncing back in the face of adversity’ – offers a positive alternative to the presently still dominant negative operationalization of human vulnerability in terms of frailty. Approaching the challenges of aging from a resilience perspective stipulates a realistic and more positive alternative to this loss-based approach to aging by focusing on the potential of older people to perform specific age-related tasks and manage transitions. This approach also envisages a more realistic alternative to concepts such as successful and active aging and offers new and promising ways for research on aging and aging trajectories. Since resilience can be viewed as an inferential construct, requiring the presence of a threat and a judgment about the quality of the adjustment in the face of this risk, this offers the possibility to study resilience in relation to different adversities that older persons can be confronted with during the aging trajectory.

#### *Quality of life in the final years of life*

The presence of multi-morbidity and functional impairments is associated with a limited life expectancy. Preferred outcomes and goals of care change in the final years of life. Quality of life and well-being become vitally important, as well as adequate care arrangements. To achieve this, new care approaches are needed that address the goals that matter most to patients. This can be geriatric rehabilitation interventions, strategies to minimize care transitions, or palliative care pathways. In all of these approaches, aspects of advance care planning, shared/collaborative decision-making and goal setting are represented with the aim to provide adequate, personalized and timely care to persons in the last years of life.

#### **Partners**

The multidisciplinary program group is well experienced in experimental studies, complex multidisciplinary interventions including randomized controlled trials, large-scale cohort studies and meta-analyses. Translation to practice is ensured by participation of clinical professionals. Large (ongoing) cohorts of the program group include, amongst others, LASA, RAI database, LTCF Ysis database, Dutch famine birth-cohort study, FIT, NL-SH, and the Advance Directives Cohort, all in all covering the whole trajectory of aging as well as different, extramural and intramural care settings. The program group is both nationally and internationally oriented and aims at large

collaborations within, for example, European working groups and national research groups and consortia. Relevant national/local partners include the University Primary Care Practice (UHP VUmc), the University Elderly Care Medicine Practice (UPO VUmc), the University Network of Long Term Care Organizations (UNO VUmc), the Expertise Center on Palliative Care (EPZ), the Ben Sajat Center (Academische Werkplaats langdurige zorg), AMC effective elderly care network (Kring Ouderenzorg AMC), the Amsterdam Center on Aging (ACA), and several expertise centers and working groups on specific conditions and issues such as falls, osteoporosis, and sensory deficits. The program group further has a strong international network aimed at large-scale collaboration within European working groups and consortia.

### Relation to other research programs within APH

There is a close interaction between “Aging and Later Life” and several other research programs within APH. With regard to complex interactions of determinants of the heterogeneity of aging and of resilience our aims are related to those of the program “Personalized Medicine”, for example when addressing individualized diagnostic and treatment modalities. To optimize and innovate methods for the analyses of data collected in these complex systems, and for the development of diagnostic and treatment modalities such as decision support systems that incorporate shared decision making, we will collaborate closely with the “Methodology” program. With regard to optimizing preventive, treatment and care strategies to improve quality of life, functioning and participation of older persons throughout the aging trajectory, collaboration with the programs “Mental Health” and “Quality of Care” is essential. This also applies to the research program “Societal participation” when evaluating preventive care or societal programs.

## VI. Quality of Care

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### Background

Demographic changes, shifting expectations about health and healthcare, technological advances and limited resources put pressure on healthcare systems all over the world. To respond to these societal changes and to make healthcare more patient centered, sustainable and available for everyone, both the organization and the content of healthcare system have to change considerably, while maintaining or improving quality.

To improve quality of care, decisions about healthcare system changes, reimbursement and financing, regulation and recommendations about specific interventions should be based on the outcomes of solid research, while taking ethical issues and legal aspects into account. Patient-important outcomes, client preferences, healthcare equity and the use of scarce resources are central issues.

With existing data resources, such as electronic patient records, determinants of quality and safety of care can be analyzed and valid and useable indicators can be developed with relevant stakeholders, such as healthcare professionals, patients, informal caregivers, and policymakers. The consequences of changes in healthcare can thus be analyzed, monitored, and adjusted, in order to maintain and improve quality and to reduce disparities in health.

In the context of major changes in the healthcare system, research of the Quality of Care program aims to optimize quality of care for individuals and groups of patients.

## Themes

### *Optimizing professional, institutional and healthcare system performance*

We will analyze the effects of various forms of knowledge management and performance management, regulatory measures, dissemination and implementation of guidelines and best practices, audit and feedback and other tools to reduce divergences between desired and observed outcomes and processes in healthcare. We will evaluate strategies to disseminate and implement the findings from sound performance assessment and to improve professional, institutional and healthcare system performance.

### *Improving safety*

We will analyze the role of various technical, professional, organizational, regulatory and patient-related factors in causing errors and adverse events, and design and implement solutions to create a safer healthcare environment.

### *Striving for equity*

We will systematically develop, improve, implement and evaluate measures to reduce or eliminate undesirable variability across patient groups and population subgroups, in access to healthcare, healthcare processes and outcomes, thereby promoting equity. We will systematically analyze and evaluate the role and effects of regulatory equity promoting measures in healthcare – at different levels: patients, care professionals, institutions and health system – as well as the ethical and legal underpinnings of healthcare equity policy.

### *Achieving person-centered care*

Together with patients, clients, care professionals and other societal stakeholders we will develop reliable and valid person-specific outcome measures. We will evaluate the (cost)effectiveness of shared decision making and other healthcare interventions that take into account ethics, person characteristics and preferences, and focus on person-specific outcomes covering the complete lifecycle of people.

## Partners

In this program researchers from different disciplines and several medical specialties closely work together. We aim to connect science and practice by collaborations between academia and healthcare practice. We will collaborate on all four themes with healthcare professionals and researchers organized in academic collaborative centers such as AHN-VUmc (Network of Academic General Practices), Child and Youth Health Care Network, Insurance medicine network, and UNO (University Network of Organizations for Elderly Care). We also closely collaborate with the Netherlands Institute For Health Services Research (NIVEL) and we participate in (inter)national quality registries such as NICE ([www.nice.org.uk](http://www.nice.org.uk)), ERA-EDT ([www.era-edta.org](http://www.era-edta.org)), Perinatal Registration Netherlands ([www.perinatreg.nl](http://www.perinatreg.nl)), Heart Interventions Committee Netherlands ([www.bhn-registratie.nl](http://www.bhn-registratie.nl)). We collaborate in research, development or implementation teams from other national scientific and (semi-)governmental organizations such as IQ Healthcare, Centre of Expertise for Standardization and E-health (NICTIZ), National Institute for Public Health and the Environment (RIVM) and the National College Health Insurance (Zorginstituut Nederland). We will explore the

possibility to collaborate with business partners dedicated to measuring and improving quality of care.

### Relation to other research programs within APH

The Quality of Care program will work closely together with the research program Methodology to optimize the use of existing data resources, such as electronic patient records, with adequate record linkage and semantic interoperability. Additionally, qualitative and quantitative methods to develop instruments to measure person's preferences are areas of shared interest.

The Quality of Care program is intimately related to the Personalized Medicine program. Personalized medicine can be defined as an adequate and desirable response to diversity, responding to individual features, needs, and goals, which is also covered by our fourth theme: *Achieving person centeredness*. Individualized diagnostics and treatment based on genetic characteristics are addressed in the Personalized Medicine program.

Maintaining and improving quality and safety of care for chronic, elderly or mentally ill patients, and patients in resource limited settings, offers opportunities for collaboration of the Quality of Care program with the programs Aging & Later Life, Mental Health and Global Health in the APH. This also applies to the research program Societal Participation & Health when preventive care or societal programs need to be evaluated.

## VII. Personalized Medicine

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### Background

The past decades have brought great progress in health, with various interventions that increase longevity, reduce suffering, and promote healthcare effectiveness and efficiency. With the combination of ongoing (bio)technological developments and the perceived need for person-centered decision making, medicine has now arrived in an era where more customization is both needed and possible. Personal genomes, information on subtypes of diseases, and individual characteristics and preferences can guide stratification and personalization in health care.

As our understanding of the human genome and disease pathogenesis has improved, theories have been developed about variability in disease susceptibility and response to prevention and treatment. Based on unique molecular and metabolic characteristics we will be able to diagnose disease more accurately, select the most effective prevention and treatments, and reduce disadvantageous side-effects.

In response to societal changes, there is increased recognition that healthcare should also become more responsive to the cultural, ethnic, socio-economic, and psychological diversity in the population. Responsiveness to individual healthcare and information needs is a necessary condition for a healthcare system that intends to provide optimal care for all. In this way we can fine-tune the healthcare system, offering stratified approaches wherever possible, and individualizing where needed, while normative (ethical and legal) aspects will be addressed.

Personalized medicine is closely related to quality of care. While many measures in Quality of Care can be seen as reducing undesirable variability in healthcare, Personalized Medicine can be defined as an adequate and desirable response to diversity. Where patients differ in terms of genetic background, biological functioning,

social and psychological characteristics, or preferences, the quality of prevention and care will profit from tailoring care to individual needs, thus increasing desirable variability and value at a population level. Where Personalized Medicine is focused on individual characteristics ('tailoring'), the appropriate healthcare response to group characteristics ('targeting') belongs to the area of Quality of Care.

## Themes

Within this program we plan to bring the prospect of personalized medicine closer by pursuing the following research themes:

### *Mapping Diversity in Healthcare Needs*

We will study diversity in (future) healthcare clients, at different levels, and analyze the relevance for health, prevention, and healthcare. We will rely on extensive genotyping and deep phenotyping to document biomedical and metabolic processes. We will analyze psychological, cultural, and socioeconomic variability in information needs, disease presentations and effectiveness of treatment and prevention, and determinants of this variability.

### *Risk Profiling*

We will rely on existing approaches (e.g. prediction modelling) and develop new techniques for risk profiling, classifying and stratifying patients and other clients, to predict benefit or harm from diagnostics and interventions (including pharmacogenomics and population screening programs). If relevant, the normative (i.e. ethical and legal) context will also be addressed.

### *Stratified Interventions*

With researchers and healthcare professionals in other research institutes within the Amsterdam academic alliance, we will systematically develop, implement, and evaluate guidelines and interventions that build on and effectively respond to biological and social axes of diversity, including genetic factors and intersectionality.

### *Training for Diversity*

We will examine how future healthcare professionals can be better trained to be receptive and effective to differences in patient diversity, presentation, needs, and goals, for example by improving care providers' skills in Shared Decision Making.

## Partners

VU(mc) and AMC researchers within this theme come from different backgrounds and will bring in external partners that reflect this broad palette. Existing successful partnerships with medical partners (clinical, general practice, public health), academic collaborative centers, local (e.g. Amsterdam) and national (semi) governmental organizations (e.g. RIVM, NIVEL), implementation organizations (e.g. Pharos), educational institutes (e.g. Netherlands School of Public and Occupational Health) will be continued and new alliances will be forged. Research is conducted in collaboration and co-creation with patient or client organizations and other stakeholder groups.

## Relation to other research programs within APH

The Personalized Medicine program will work closely together with the research program Methodology to optimize the use of existing data resources, such as electronic patient records, with adequate record linkage and semantic interoperability. Additionally, qualitative and quantitative methods to develop instruments to measure person's preferences are areas of shared interest. The Personalized Medicine program is most closely related to the Quality of Care program. Personalized medicine can be defined as an adequate and desirable response to diversity, responding to individual features, needs, and goals, which is also covered by *Achieving person-centered care*, the 4<sup>th</sup> theme of Quality of Care. However, individualized diagnostics and treatment based on individual genetic or other characteristics is part of the program Personalized Medicine.

## VIII. Methodology

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### Background

Addressing scientific and societal questions about public health and healthcare requires appropriate methods and instruments that are fit for purpose and the deployment of sound analytical techniques. Through technological advances on one hand and developments in other research areas on the other hand, there is a constant need and relentless impetus for further refinement and targeted improvement in methods. The development, application, and validation of methods and instruments are key aspects of every step of the scientific process, from the definition of a new idea until the delivery or implementation of a health (care) product. Hence, the central aim of the Methodology research program is to develop, evaluate, implement and apply instruments and methods, in order to optimally facilitate health care innovations and to publish on the progress achieved.

Methodological research topics include elements of epidemiology, biostatistics, informatics, clinimetrics/psychometrics and may be organized in the flowchart model appearing below. The model consists of four *phases* that naturally correspond to the lifecycle of (empirical) research. Although we collaborate with many clinical and biomedical partners, we foresee the consolidation of internal collaboration within the Methodology program by working on some of the many real-world problems that naturally cover a wide spectrum of the model's phases.

### Themes

Every phase in the flow chart model relates to research *themes*. The themes do not cover the full methodological research area, but they correspond to examples of research activities already identified among the program partners and they illustrate the breadth of what constitutes methodological research:

*The "Define" phase: how do we specify outcome measurements and how do we design our study?*

To document the outcomes of healthcare, both for effectiveness research and for monitoring and improving the quality of care, we need appropriate **measurement instruments**. We will continue to work on the development of **core outcome sets, risk factors and predictors**, in multiple areas in healthcare, construct **patient-reported**

**outcomes** that are fit for purpose, and further improve on instruments to measure quality-of-life, adherence, patient preferences, and patient-important outcome measures. We will also advise on study designs and develop efficient strategies for novel trials where the effect of a treatment may be associated with patient features.

*The “Collect” phase: how do we collect data, extract data from information systems and link data from different medical records?*

Electronic patient records and routinely collected and/or publicly available data play an increasing role in (bio)medical research. There is a need to link separate medical records together (**medical record linkage**); to make information systems **interoperable** so they can communicate together, and **automate** the process of obtaining data at distance (**telemedicine** and **e-health**) and pre-specified (quality) **indicators**. This requires research on the development, adaptation and evaluation of linkage, interoperability and automation methods.

*The “Model and Interpret” phase: how do we model our data and interpret the estimates?*

This phase concerns a broad research area in the Methodology program and covers several research themes, including quantitative genomics, disease and system modeling, predictive (diagnostic and prognostic) models, **meta-analysis** and causal inference.

Recent revolutions in biomedical research have led to an increasing quantitative need for handling and interpreting the sometimes massive data from genetics, genomics, proteomics, epigenomics and other omics-based research (**quantitative genomics**). To support this research, we have to contribute to the development of new, efficient and targeted techniques for variable selection, omics-based predictions, inference for molecular integration, disease subtyping, and estimating (integrative) molecular networks.

The challenging complexity of biological systems, diseases, and their impact on patients and society can be better understood by developing appropriate mathematical models (**Systems Medicine**). Such models allow the development and testing of hypotheses about the properties of cells, tissues, organisms, and disease manifestations. Mathematical models are also increasingly used to understand the transmission of infections and to evaluate the potential impact of infectious or chronic disease control programs in reducing morbidity and mortality.

Clinical **predictive (diagnostic and prognostic) and etiological models** are widely used in clinical research to support clinical decisions and to provide better, patient-tailored care. We will contribute to providing optimal solutions and continue to improve upon existing methods.

With the increasing number of published (randomized and non-randomized) trials it is important to invest in methods for **meta-analysis**. In addition, although the randomized trial remains the cornerstone for estimating the effectiveness of healthcare interventions, alternative designs are increasingly applied, such as case-control time series analyses, or analysis from routinely collected observational data in the Big Data context. We will benefit from and contribute to the advancements in **causal inference**, based on implementing appropriate techniques to approach exchangeability based on observational data.

*The “Deliver” phase: how do we implement and communicate our results?*

The implementation in practice of knowledge obtained from research, such as a clinical guideline or a probabilistic prediction model, is a considerable problem. One delivery approach to improve dissemination is using **audit & feedback** mechanisms, e.g. based on quality indicators. With the advent of Electronic Patient Records, **computerized decision support systems** (CDSSs) are emerging as a promising implementation instruments aiming at delivering feedback to the user at the point of care. Implementation also necessitates a good understanding of **communication** with the patient and how **shared decision-making** can be facilitated.

### Partners

Partners within the alliance consist of methodologists in the broad sense of the word including epidemiologists, (bio)statisticians, bio/medical-informaticians, computer scientists, psychologists, etc. External public partners include: Ministry of Health, Wellbeing and Sports (VWS), RIVM, regional Screening organizations (Midden-West, Zuid-West en Oost), and the National College Health Insurance (ZorgInstituut Nederland), Central Bureau of Statistics (CBS), Netherlands Organization for Applied Scientific Research (TNO), Netherlands Comprehensive Cancer Organization (IKNL), Nationwide Network and Registry of Histo- and cytopathology (PALGA), Netherlands Institute For Health Services Research (NIVEL), GGD Amsterdam. External collaboration network partners include: TraIT, DTL, STAR: Stochastics, Amsterdam Data Science, PROMIS Health Organization, OMERACT, COMET, HOME, REWARD Alliance, EQUATOR network, Cochrane Collaboration.

Factors indicating whether work is “methodological” include one or more of the following: the type of (intended) journal for publication; whether a (primary or secondary) aim of the work pertains to a method, theory, instrument, system, framework, etc.; and whether it is a “non-standard” contribution to facilitate clinical and biomedical research. The program is, hence, not intended as a mere service platform to clinical researchers, but primarily dedicated to contribute to our understanding of methodology. External partners include domain experts (e.g. clinicians, biologists) and others) and methodologists from outside the alliance.

### Relation to other research programs within APH

The methodology program is not bound by specific clinical or public health domains; it cuts through and empowers all other Amsterdam Public Health programs.

## 3. Participating Departments and PI's/Research Groups

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All eight research programs combine expertise from a broad range of disciplines spanning from basic sciences to community research in keeping with the life course perspective inherent in public health and the twofold translational nature of our research, from bench to bedside and from in-hospital to extramural setting (see figure 2).

...disposition...prevention...risk stratification...medical intervention...surveillance...monitoring...medical management...

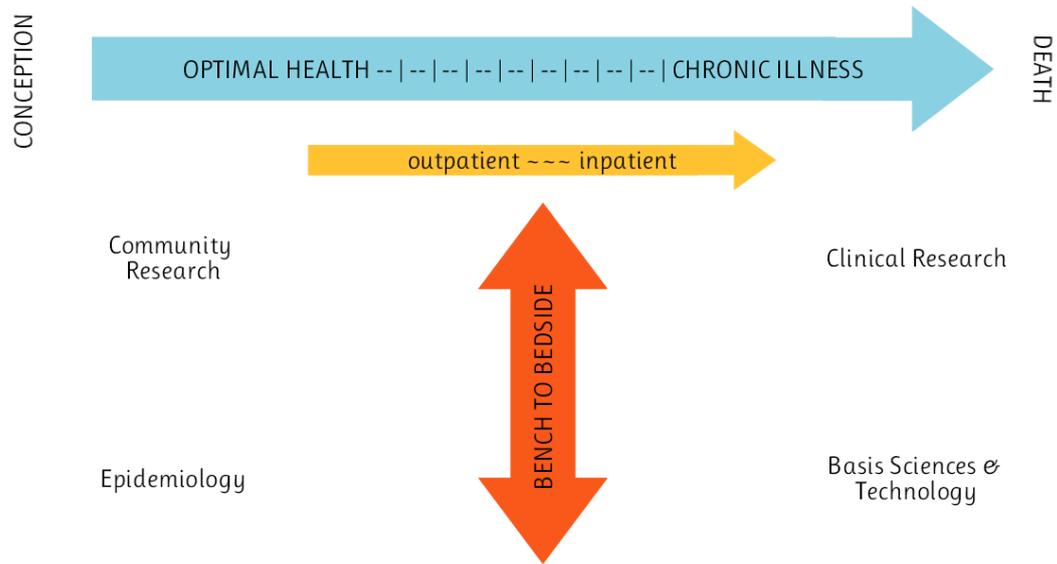


Figure 2 – Translational research: from intramural to extramural and from bench to bedside

The table below illustrates the multidisciplinary nature of the institute by listing the participating departments (19 in the AMC, 16 in the VUmc, and 6 in the VU). The table also specifies the total number of 1,319 researchers (principal investigators (PI), research staff, post docs and PhD students) who participate in the Amsterdam Public Health research institute.

Table 1: Participating departments in the Amsterdam Public Health research institute

(Around 17 researchers (14 VU/VUmc/3 AMC/UvA) researchers are employed by two departments)

\*AMC FTEs are estimated (Sep 2016) by taking .46 as input per researcher

Departments AMC	Head of department	PIs	no of researchers	research FTE
Clinical Epidemiology, Biostatistics & Bioinformatics	Prof. A.H. (Koos) Zwinderman	5	37	17,0
Coronel Institute of Occupational Health	Prof. J.K. (Judith) Sluiter	4	51	23,5
Dermatology	Prof. R. (Rick) Hoekzema	1	17	7,8
Ear, Nose and Throat	Prof. W. J. Fokkens	1	11	5,1
Experimental Immunology	Prof. T.B.H. (Theo) Geijtenbeek	1	11	5,1
Global Health	Prof. F.G.J. (Frank) Cobelens	3	29	13,3
Gynaecology	Prof. J.A.M. (Joris) van der Post	2	48	22,1
Internal Medicine	Prof. J.M. (Jan) Prins	5	51	23,5
Knowledge Center Teaching & Training	Prof. R. (Rien) de Vos	1	3	1,4
Medical Informatics	Prof. A. (Ameen) Abu-Hanna	4	31	14,3
Medical Psychology	Prof. F.J. (Frank) Snoek	3	25	11,5
Orthopedics	Prof. C.N. (Niek) van Dijk	1	5	2,3
Pediatrics	Prof. J.B. (Hans) van Goudoever	3	48	22,1
Primary Care Medicine	Prof. H.C.P.M. (Henk) van Weert	6	62	28,5

<b>Psychiatry</b>	Prof. D.A.J.P. (Damiaan) Denys	2	21	9,7
<b>Social Medicine</b>	Prof. A.E. (Anton) Kunst	6	64	29,4
<b>Radiology</b>	Prof. J. (Jaap) Stoker	1	10	4,6
<b>Surgery</b>	Prof. D.A. Legemate	1	8	3,7
<b>Urology</b>	Prof. J.J. (Jean) de la Rosette	1	30	13,8
<b>Subtotal AMC</b>		<b>51</b>	<b>551</b>	<b>253,5</b>

AMC Partners	Head	PIs	no of researchers	Research FTE
Sanquin Blood Supply	H.M. (Maarten) le Clercq, ChE	3	12	5,5
Dep. of Communication Sciences, UvA	Prof. J. (Hans) Beentjes	3	21	9,7
<b>Subtotal AMC partners</b>		<b>6</b>	<b>33</b>	<b>15,2</b>

Departments VUmc	Head of department	PIs	no of researchers	Research FTE
<b>Anesthesiology</b>	Prof. S.A. (Stephan) Loer	1	1	0,5
<b>Clinical Genetics (including Community Genetics)</b>	Prof. E.J. (Hanne) Meijers-Heijboer	2	14	6,13
<b>Clinical Pharmacology &amp; Pharmacy</b>	Prof. È.L. (Noortje) Swart	1	2	1,07
<b>Epidemiology &amp; Biostatistics</b>	Prof. J. (Hans) Berkhof	13	53	30,06
<b>General Practice &amp; Elderly Care Medicine</b>	Prof. H. (Henriëtte) van der Horst	7	57	22,77
<b>Internal Medicine (including Endocrinology; Nutrition &amp; Dietetics)</b>	Prof. M.H.H. (Mark) Kramer	5	12	8,05
<b>Medical Humanities</b>	Prof. G.A.M. (Guy) Widdershoven	5	41	18,78
<b>Medical Psychology</b>	Prof. F.J. (Frank) Snoek	3	10	5,26
<b>Midwifery Science</b>	Drs G. (Gea) Vermeulen	1	19	8,69
<b>Obstetrics &amp; Gynaecology</b>	Prof. C.J.M. (Christianne) de Groot	1	3	0,5
<b>Ophthalmology</b>	Prof. H. (Stevie) Tan	1	9	4,06
<b>Otolaryngology, Head &amp; Neck Surgery</b>	Prof. C.R. (René) Leemans	2	27	11,44
<b>Pediatrics (including Child &amp; Adolescent Psychiatry)</b>	Prof. J.B. (Hans) van Goudoever	2	28	17,77
<b>Plastic, Reconstructive and Hand Surgery</b>	Prof. M.J.P.F. (Marco) Ritt	1	6	1,39
<b>Psychiatry - GGZ InGeest</b>	Prof. A.T.H. (Aartjan) Beekman	14	85	34,57
<b>Public &amp; Occupational Health</b>	Prof. A.J. (Allard) van der Beek	15	134	45,58
<b>Pulmonary Medicine</b>	Prof. A (Anton) Vonk Noordegraaf	1	1	0,75
<b>Rehabilitation Medicine</b>	Prof. V. (Vincent) de Groot	4	10	3,6
<b>Surgery</b>	Prof. H.J. (Jaap) Bonjer	-	2	0,20
<b>Urology</b>	Prof. R.J.A. (Jeroen) van Moorselaar	-	2	0,11
<b>Subtotal VUmc</b>		<b>79</b>	<b>516</b>	<b>221,03</b>

Departments VU	Head of department	PIs/ lead ers	no of researchers	Research FTE
<b>Health Sciences</b>	Prof. M.W. (Maurits) van Tulder	9	59	30,19
<b>Athena Institute</b>	Prof. J.E.W. (Jacqueline) Broerse	9	34	14,35
<b>Biological Psychology</b>	Prof. J.C.N. (Eco) de Geus	4	27	15,68
<b>Clinical, Neuro- &amp; Developmental Psychology</b>	Prof. W.J.M.J. (Pim) Cuijpers	10	68	42,57
<b>Clinical Child and Family studies</b>	Prof. C. (Carlo) Schuengel	2	32	8,78
<b>Subtotal VU</b>		<b>34</b>	<b>220</b>	<b>111,57</b>

In keeping with the pan Amsterdam and multidisciplinary character of the research, the institute cuts across universities, medical center divisions and several departments. Part of the departments that participate in the Amsterdam Public Health research institute will also have researchers that participate in other research institutes of the University Medical Centers Amsterdam (UMCA) and some researchers will have a dual membership. This reflects the fading boundaries between intra- and extramural care and the importance of patient research that connects prevention, cure, and care.

## 4. Strategic Partners

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Collaborations with strategic partners are essential elements in the research institute for reaching its goals. These partners can be found at different levels.

In research, the institute will team up with investigators in other research institutes within the UMCA, both those interested in public health per se as well as those whose research topics, methods, cohorts or biomaterials can foster research within the institute's respective programs.

A successful strategy for bringing regional partners together are the academic collaborative centers (Academische Werkplaatsen). These are close collaborations in research, training and practice, based on long-term contractual agreements, between investigators, practitioners and managers. Such existing collaborative centers include those with the Child and Youth Health Care, Health Care Inspection, National Institute for Employee Benefits, Occupational and Environmental Health Services, Tata Steel and KLM, Network of Academic General Practices, AMC HagNet (Stichting Gezondheidscentra Amsterdam Zuid-Oost, Gezondheidscentrum Diemen-Noord, Praktijk Buitenhof Amsterdam), University Network of Organizations for Elderly Care (UNO), Prezens by GGZ inGeest, Trimbos Institute Utrecht, 's Heerenloo institution for the intellectually disabled, the Sarphati Initiative, and the academic collaborative center Public Health in Noord Holland-Flevoland.

The research institute will redefine and strengthen its collaborations with other knowledge institutes in the fields of primary care and public health, such as other universities in the Netherlands, RIVM, NIVEL, TNO, and the Dutch Healthcare Institute.

The research institute will be the major interface between intramural health care of the University Medical Centers Amsterdam (UMCA) and the vast extramural health care

field. As such it will develop and maintain ties to (scientific) professional organizations, government bodies in public health at different levels (municipal, provincial, national) and stakeholder organizations.

## 5. Talent Development

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The Amsterdam Public Health research institute will comply with the strategies deployed by the participating organizations for talent development. We will work with respective Graduate Schools for monitoring PhD projects.

In addition to the central facilities, the APH formed a **PhD/PD committee** (*Commissie OK (Opleidings Kwaliteit)*) during the summer of 2017 with the aim to support, guide, train and prepare the next generation of Public Health researchers. Promising young researchers will be encouraged to prepare career development grants and postdoc projects after obtaining the PhD. The research institute will seek funding for dedicated time to prepare successful proposals. In addition, the research institute has a key role in scouting young and midcareer research talent and supporting their academic career.

The **PhD/PD committee** consists of senior investigators, PD researchers and PhD students. The committee has two chairs (one from AMC/UvA, one from VUmc/VU). Each research program delivers members. The Committee organizes the introduction of new PhDs/PD's into the institute's structure, may offer assistance when PhD students find themselves in a dispute with their supervisors, start a 'APH PhD intervision activities program' that connects PhD researchers in the institute with each other to discuss common scientific and organizational issues, and organizes the PhD and PD network. Moreover, the Committee writes and updates the 'PhD manuals' with details about the various general and institute-specific steps PhD students need to be concerned with in the various phases of their project.

At the PD level, the Committee writes the 'APH PD manual' and updates it. This manual details the various general and institute-specific steps PD researchers need to be concerned with in this phase of their career. The Committee organizes the introduction of PD researchers into the institute and organizes the 'APH PD intervision program' that connects PD researchers in the institute with each other to discuss common scientific and organizational issues. Individual coaching trajectories can be asked for by individual PD researchers with the APH management.

Success and accomplishment in research are key elements throughout **academic careers**. The directors of the research institute will provide recommendations in the UMCA research board or to the Dean about promotions to the level of associate and full professor in the participating organizations.

## 6. Quality Policy: Promotion, Control and Monitoring

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The Amsterdam Public Health research institute attaches great importance to providing an environment that encourages good conduct in research and discourages misconduct, and uses a number of instruments to facilitate scientific integrity and scientific quality in all phases of research, including study design, data collection, data analysis and reporting.

### Internal Accountability

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Management collaborates closely with colleagues in the other Research Institutes to create strong excellence centers in research and a strong infrastructure for research in the AMC/VUmc/VU/UvA.

Management meet frequently (one-monthly) with the 16 Program Leaders to update the internal strategy and to discuss anticipatory or reactive response to external events. The Program Leaders in turn, meet their Program Council with PIs covering their themes to discuss whether goals are met and the vision can be lived.

The quality policy of the APH will comply with the policy in the UMCA (e.g. JCI, minimum sets of arrangements). In addition, internal quality policy is set and monitored by **the Science & Quality Committee** (*de Commissie WK (Wetenschappelijke Kwaliteit)*) that was formed during the Summer of 2017. The Committee consists of two chairs and 22 members and is a representative reflection of midcareer and senior scientists in the institute, with at least two members from each of the eight programs. They provide advice on the topic of scientific quality to the management and meet four times per year.

Procedures are started to be able to set minimum requirements to ensure scientific quality and start procedures to organize and perform thematic audit activities on the topics of quality improvement and quality assurance. An important activity is to create a database of all starting research projects and organize audits in the programs.

The Think Tank of twelve young Public Health researchers started in the summer of 2017 and act as a sounding board and a 'future forum' for Management, advising on policy decisions yearly and by providing unsolicited input at any time.

### External Accountability

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Regular evaluation of the research institute is done according to the national Standard Evaluation Protocol (SEP) of Netherlands Organization for Scientific Research (NWO), The Royal Netherlands Academy of Arts and Sciences (KNAW), and the Federation of the Netherlands Universities (VSNU). At three and six year intervals an internal research self-evaluation is performed by the UMCA research board, the first planned over the period 2016-2018. With a lag of three years this is followed by an external panel of international reviewers. Criteria in the SEP are scientific quality, societal relevance, and vitality.

An External Advisory Board consisting of external members (e.g., from major collaborators like GGD Amsterdam, RIVM, GGZ, European Public Health association) started in the winter of 2017 (see Appendix D). The Board provides guidance on the overall strategy of the institute including the viability of existing research programs or the need for new programs. Members were selected on the administrative, academic and/or policy experience deemed relevant to the adopted broad definition of Public Health research APH and for their interest in transmural and extramural health care and research. Members have no direct interest in the institute. We achieved a balanced composition of members representing the various areas within APH.

## **7. Institute Specific Facilities and Infrastructure**

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The Amsterdam Public Health research institute will use core facilities of the participating organizations, such as biobanking, data management, data warehousing, cluster computing, survey tools, IT support, dedicated officer grants desk, as well as central support groups for large grants. In addition, the APH will provide dedicated business development support (Business Developer IXA, started spring 2017) and will assist talented researchers to improve the chances of acquiring personal grants.

Research groups in the institute coordinate and maintain large scale cohort studies such as the Netherlands Twin Register (NTR), Netherlands Study of Depression and Anxiety (NESDA), Netherlands Study of Depression in Older Persons (NESDO), Netherlands OCD Association (NOCDA), HCHA, GROUP, European Network of National Schizophrenia Networks Studying Gene-Environment Interaction (EU-GEI), Netherlands Longitudinal Study on Hearing (NL-SH), Longitudinal Aging Study Amsterdam (LASA), Amsterdam Born Children and their Development (ABCD), Healthy Life in an Urban Setting (HELIUS), Dutch Famine Birth Cohort Study, and GENERATION2. They also maintain (inter)national databases like RAI and the LTCF Ysis database.

At the level of the institute, we will try to organize a core facility for these large scale epidemiological resources, as well as for methodological innovation.

## **8. External Funding and Acquisition**

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Increased power of acquisition is a major driver motivating the formation of the Amsterdam Public Health research institute. Research funding is expected to be based for 40% on NWO and EU grants, 20% on other public funding through e.g. VWS or charitable funds, 25% based on societal partners (e.g. UWV) and 15% through public-private collaboration.

An active network with relevant funding agencies will be maintained by the Management, the Program Leaders and the PI's, amongst others by memberships of committee's and advisory boards. Being part of the major academic player in Public Health in the Amsterdam metropolitan area should make this task quite feasible. For the same reason the institute's researchers will be more successful in competing for these public national and international research funds, in particular excellent science (NWO-VI, ERC, Marie Skłodowska Curie) and program grants within ZonMw and the Societal Challenges calls of Horizon 2020 or RFAs issued by the NIH. To support this,

the institute will signal grant opportunities, facilitate cross-disciplinary contact, and mediate connections to NGO's and private partners that can help implement research outcomes and generate societal and economic impact. Participation of such partners to grant proposals is increasingly demanded by major grant organisations. The UMCA grant desk will provide administrative and legal support for grant applications.

A leaflet of the institute will be made available that includes standard information useful in the 'embedding' paragraph of grant applications including a short description of governance, research quality policy, and a track record of successfully completed or ongoing projects in various major programs (ZonMw, Horizon 2020's ERC, ITN, or Societal Challenges), and past societal and economic valorization. In addition, a roadshow presentation will allow all management and research leaders to present and brand the institute in uniform fashion.

The institute will further actively seek to lead consortia applying for large scale funding within the NWO gravity program or the EU Joint Programming Initiatives, IMI and EIP-AHA. Multi-year collaborative agreements will be sought with public partners like GGD Amsterdam, Cordaan and the Primary Care Network Amsterdam, and with private partners like ArboUnie, KLM, and, using the Amsterdam Economic Board as a main hub, with the many SME's in the region with a Public Health scope. The institute will also actively seek to keep or put Public Health themes on the regional, national and international research agenda.

## **9. Societal impact and Valorization**

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The research topics within the research programs are identified in close collaboration with stakeholders and the topics as defined by the National Science Agenda. A regular consultation process with stakeholders will guide priority setting within each of the research programs.

The research institute will provide an important source of input for the training of bachelor and master students and health care professionals taking place in the departments listed in table 1.

Through direct interactions and active dissemination policies we will communicate our research findings with decision makers, policy makers, public health professionals, clinicians, patient and citizen groups. We contribute to the development and dissemination/implementation of guidelines and we actively engage in the public debate on responsible innovation in health care.

Our research reaches from universal, selective and indicated prevention to care-related prevention. To achieve prevention in practice, our findings have to be utilized. Valorization is "the process of creating value from knowledge by making knowledge

suitable and/or available for societal use and translating that knowledge, whenever possible, into competitive products, services, processes and entrepreneurial activity”<sup>3</sup>.

A strategy will be developed in conjunction with Innovation Exchange Amsterdam (IXA) on how to combine academic and industrial activities in grant applications and how to collaborate with industry to create sustainable solutions in health care, while maintaining sufficient academic independence. Our dedicated business developer will actively grow APH’s research portfolio with SME and industry partners.

## **10. Communication**

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The Amsterdam Public Health research institute will call upon professional experts to develop a communication strategy in 2018, both at the level of the institute and of the respective research programs, and both internally and externally. The institute wants to engage effectively with all stakeholders, to meet core organizational objectives, to demonstrate the success of its research efforts, and to ensure that sponsors and the general public understands our activities. The research institute will develop a matching press plan to raise its profile through the media - print, broadcast and online - and a web strategy, to strengthen its online presence in a way that matches the overall UMCA communications strategy.

### **Internal Communication**

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The aim of the institute’s internal communication is to create a community of researchers with like interest, but stemming from different disciplines and research traditions (e.g. clinical and preclinical, from behavioral and biomedical domains, and using qualitative and quantitative methodologies). The website (started in 2016), together with both institution-wide, and program-specific e-newsletters (started in 2016) are used for the central dissemination of information on lectures, seminars, colloquia and other events as well as information on calls, highlighted papers, inspiring grant successes etc.

Discussion facilities through digital platforms will be facilitated for specific groups like PhDs or the alumni-network, in 2018. Each of the programs organizes regular master classes and the institute organizes annual meetings for all of its senior and junior researchers.

### **External Communication**

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The institute is developing an active branding and public relations strategy using the website, but also providing conference banners, templates for roadshows and presentations and assistance in connecting to the media. At the research community portals of the website a description of the ongoing projects in each of the programs

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<sup>3</sup> Bron; Nederland Ondernemend Innovatieland, 2009

and the research staff will become available as well as the illustrated versions of (annual) reports.

- For the public at large we aim to disseminate scientific findings/knowledge in lay man's terms, amongst others by a short lay man's description of the most cited papers and an overview of recent media appearances.
- The website portal for (medical) professionals at large aims to disseminate scientific findings/knowledge in usable and practical terms, amongst others by a short description of the most interesting papers for professional's daily work and an overview of recent media appearances.
- Communication with the international research community is achieved through high quality scientific peer-reviewed publications, which we strive to be open-access.
- Scientific meetings, lectures and masterclasses will be organized to discuss important Public Health topics and disseminate results

Membership of the institute helps researchers to radiate a professional corporate identity. The APH provides continuity and stability to external partners, public and private alike, who prefer not to depend on isolated individuals but on teams of individuals backed by a larger research organization. This is particularly salient when engaging in contracts and long-term collaborative agreements.

## 11. Organization, Management and Budget

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### Organization and Management

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The *organizational structure* of the Public Health research institute is depicted on the next page (Figure 3).

**APH Management** consists in the first four years of two **Directors**, one from both UMCs. Martine de Bruijne (VUmc/VU) and Judith Sluiter (AMC) are currently the co-directors of the Amsterdam Public Health research institute. Together with the directors of the other research institutes, **Management** takes part in the future **UMCA Research Board**. The Research Board will meet every 4 weeks in the first two years and later bi-monthly to align the policy of all UMCA research institutes and to shape the UMCA research policy on issues that transcend a single institute. This may include ethics review, PI score methodology, criteria for full professorships, research output registration, large scale research infrastructure, and financial project control (quarterly). The UMCA dean meets and chairs the UMCA Research Board quarterly. Annually, a strategy day is held between Research Board and UMCA Board, head of departments and Division Boards. Annually a half-day strategy meeting is held with UMCA board and Division Boards. Bi-annually, the Research Board meets with young talent.

The **Board of Deans** of the participating VU/UvA Faculties and the UMCA acts as the main supervisory organ of the Amsterdam Public Health research institute. Annually, a meeting with APH Management is used to discuss and approve the annual work plan and deliverables and the use of budget. The Board of Deans, chaired by the UMCA dean, appoints the Directors.

There are eight thematic **Research Programs**. **Program leaders** (two per program till the end of 2019) coordinate the APH activities in their program. **Management** meets monthly with the 16 **Program Leaders** to update the internal strategy and to discuss anticipatory or reactive response to external events. Actions flowing forth from this and the daily operation of the institute are delegated to the **Directors** and **Support Staff**. Support staff is appointed by the Directors. The Program Leaders chair their **Program Council** with 4-6 PIs at minimum within the program.

Each **Program Council** consist of a selection of PI's in the program, appointed by the Program Leaders and meet at least bi-annually to implement or update the program specific strategy and to discuss anticipatory or reactive response to external events; daily business of the program is delegated to the APH Support Staff and program specific administrative support.

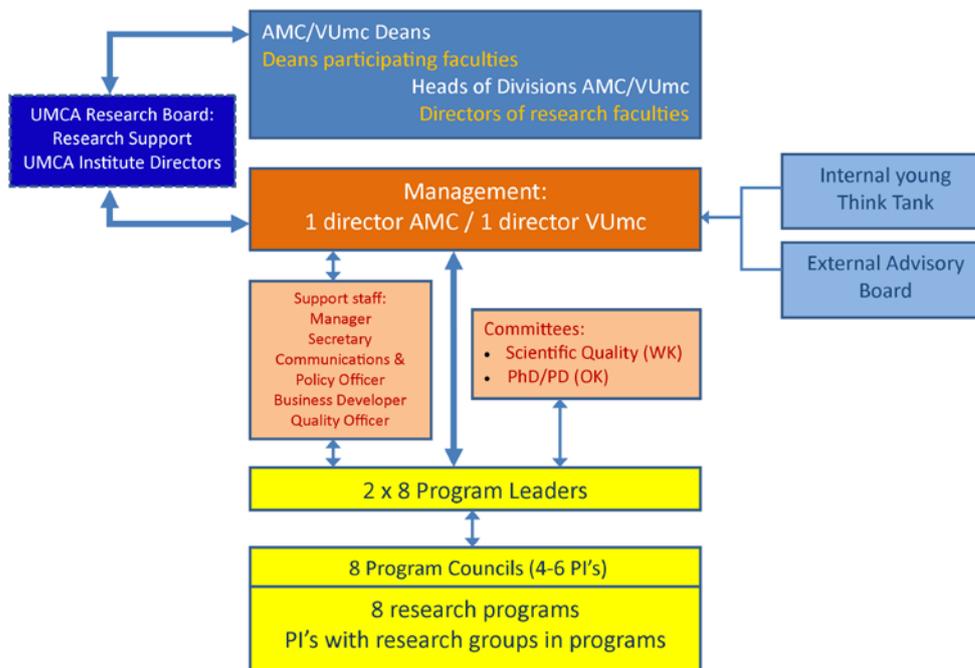


Figure 3 – Organizational structure of the Amsterdam Public Health research institute

The Directors may meet periodically with the **Heads of the Divisions**<sup>4</sup> that collaborate with more than four departments in the Amsterdam Public Health Institute. This ensures a good alignment of the mission of the research institute with the hierarchical organization of the UMCA and the Universities, in terms of research resource allocation. The meetings will address the mission, vision and policy of the institute and will address criteria for admittance and total the researchers that participate in the institute on behalf of the departments.

<sup>4</sup> Or the directors of research of participating faculties at VU and UvA.

The selection of researchers will typically be based on research teams around a PI. Criteria for admittance (2016-2020) are a good fit to one or more themes in at least one research program.

Management meets quarterly with two APH **Committees**: the **science/quality committee** and the **PhD/PD committee**. The first committee co-develops and implements APH-specific research quality policies and guards UMCA policies regarding the quality of research. The second committee co-develops APH-specific educational activities, PhD and talent guidance and support the network of PhD and PD researchers.

A **Think Tank** of younger Public Health researchers acts as a sounding board and a 'future forum' for Management. They will advise on policy decisions bi-annually and can also provide unsolicited input at any time.

The **External Advisory Board** consists of external members with a senior position in the 'Public Health' field and its institutions. They meet with Management bi-annually and can provide unsolicited advice at any time.

The staffing of Management and Program Leaders for 2016-2017 is listed in Appendix A. In the fall of 2017, it will become clear if staffing of Program Leaders for 2018-2019 will remain the same.

## Budget

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In 2016, AMC Division J/K and VUmc Division VI freed up part of their budget to support the building phase of the new APH institute, and this was supplemented by innovation funding from AMC/VUmc executive boards. In 2017 and 2018 a total of ~960k € will be available per year, with added funding of the VU and UvA from 2018 onwards. This funding will provide the Institute with sufficient support for the operational costs, research infrastructure and facilitating societal and scientific impact in the building phase. If the UMCA wants to meaningfully compete in the field of Public Health internationally, increased structural funding for the Amsterdam Public Health research institute is essential. Structural funding in its mature phase should ideally amount to 2% of the estimated 90 million for the institute's annual research budget (~1.8 M€).

Three components in the budget of the institute can be discerned: (1) the institutes' operational costs, (2) funding for its cohorts infrastructure and (3) funding to increase scientific and societal impact.

### Operational Costs

The institute has a number of core tasks including facilitating multidisciplinary collaboration, maintaining (or improving) quality of research practice, internal and external visibility of research, active supporting of external acquisition, talent development, societal and economic valorization, maintaining (or innovating) infrastructure, unique resources and expertise within the institute. For this it needs

about ~450 k€ annually in 2017 and 2018 and this has been agreed upon by the Boards of Divisions JK and VI:

- Scientific Directors (0.5 FTE, salary scale 18+)
- Manager (1.0 FTE, salary scale 11)
- Support staff
  - Research Quality Officer (1.0 FTE, salary scale 11)
  - Business Developer (0.5 FTE, salary scale 11)
  - Secretary AMC (0.5 FTE, support Manager + Director, Science/Quality Committee, meetings & events organization, scale 7,8)
  - Secretary VUmc (0.5 FTE, support Manager + Director, PhD Committee, annual report data-mining, scale 7,8)
  - Part time program secretaries (8\*0.2 FTE, scale 7,8)
- Running costs (annual meeting and program meetings, website design and maintenance, annual report costs, advisory board & standing committee meetings, general office expenses, traveling costs Director, PhD travel grants, sponsoring) ~100 k€

Innovation funds are available to support the high quality research to improve citizen health, reduce health inequalities, transform healthcare, and empower citizens (500 k€ annually has been allotted from 2016 to 2019, with added innovation funds of the VU and UvA from 2018 onwards).

### Cohorts Infrastructure

These are key resources for a Public Health institute. Longitudinal cohorts with rich biobanks are and will be a crucial factor in the international visibility of the UMCA, and development of the next-generation of (bio)statistical and clinimetrics methodology has always been a strong point of Public Health institutes – the AMC and VU/VUmc not being exceptions. These resources are paramount for attracting external funding but they are usually hard to co-fund in grant proposals; they are often considered to be an existing asset that makes the grant proposal competitive rather than something that needs to be created by the grant money itself.

A support unit will be built which, in analogy with CLINICAL TRIAL units, could be called a COHORT unit: expertise is centralized around the design, logistics and performing (cont'd) measurements in the cohort studies 2.0, that suits the new opportunities to gather information from various sources on the subject of study and the dynamics of health that are still rarely built into cohort studies. Because external structural funding is a major challenge the institute needs to actively invest in these resources.

### Scientific and Societal Impact

Innovation funds are reserved each year to increase the scientific and societal impact of the institute. Goals are to generate highly cited papers and to increase translation and successful implementation of scientific findings in health care. Innovation funds are used to (1) increase the hit rate of collaborative program grants at ZonMw (TOP) and the EU (Horizon 2020) by freeing up senior staff (assisted by an up-and-coming) for grant writing; (2) execute high risk first proof-of-concept studies; (3) facilitate 'out-of-the-box' ideas that do not conform to current themes but could grow into future

themes, and (4) strengthen the academic collaborative centers with our societal partners.

## What was planned for the building phase of the Organization (2016 and 2017)

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In this period the transition of the VU/VUmc researchers from EMGO+ to APH took place, the introduction of the PI-system at VUmc started in the summer of 2017, and a re-acquaintance of the AMC researchers with the research institute organization took place. Starting 2016, most EMGO+ researchers became part of an APH program. The EMGO+ Institute was subjected to a 6-year visitation in the fall of 2016 with excellent judgments on all three SEP indicators. The AMC PI's for the AMC in total and the theme Public Health & Epidemiology are evaluated October 2017. The PI Scores for PIs of VUmc need to be calculated in 2017 as well. The outcomes will also be available for the APH program leaders. The building phase ends on December 31, 2017.

The building phase had a number of objectives:

### Alliance activities:

- Collaborate closely with colleagues in the other Research Institutes to create a strong infrastructure for research in the AMC/VUmc/VU/UvA (2016 and 2017)

### Build a strategy by which our vision can be lived:

- Familiarize the researchers of VUmc/VU and AMC/UvA with each other and promote a spirit of common purpose in the APH and in each of the eight programs (2016)
- Building cohesion and synergy between researcher groups in the programs (2016-2017)
- Provide support commissions to be able to start improving the quality of research in APH (2017)
- Develop the APH branding and communication with the stakeholders (2017)
- Support the unique expertise and resources within the institute (2017 onwards)
- Promote and support high-risk or proof-of-concept studies (2016 and 2017)
- Integrate research initiatives by stimulating collaborative PhD grants and post-doc activities over the academic institutions and over programs (2016 and 2017)
- Build an educational tract for our PhD and post-doc researchers (postponed to 2018)
- Recruit, train and prepare the next generation of Public Health researchers for health research and our society (2017 onwards)

### Event organization:

- An annual event (in 2016 and 2017) for all researchers in the institute
- An annual event (CaRe) for the PhD students in the institute (2017)
- Regular scientific and strategic events in every research program (2016 and 2017)

## Budget allocation:

### Phase 1 (2016)

The Division JK/EMGO+ funds were used in part for the institute's co-directors and the bureau (policy part time workers) to support:

- i. external communication (e.g. provide starting content and daily update new APH website);
- ii. two *ad interim* committees to set up a future structure for research quality and PhD-PD committees;
- iii. set up the eight program councils led *ad interim* by two Program Directors;
- iv. organize a first Amsterdam Public Health Annual Meeting 60 k€.

AMC/VUmc Boards 500 k€ innovation funds: Eighty percent of the 500k innovation funds coming solely from the AMC/VUmc Boards were spread over the eight programs as follows: each of the programs received ~50 k€ of the innovation funds to foster cohesion within the program by activities that support (1) joint applications, (2) joint publications, (3) shared visiting professors, or (4) temporary embedding of researchers in academic collaborative centers.

Twenty percent of the annual 500k from 2016 to 2019 will be used for high risk research of proof of concept studies. Every program is entitled to receive 50k once in the four-year period. In 2016 and 2017, only VUmc and AMC have contributed to the innovation funds, so that VU and UvA partners cannot formally be primary recipients of these additional funds. Therefore, spending has to be within a VUmc or AMC department.

This phase had the following concrete deliverables:

Deliverables second half of 2016	Timeline
Integrate research initiatives by stimulating collaborative PhD grants and post-doc activities over the academic institutions and over programs	July-December 2016 Done, in the 8 programs.
Build a strategy (project plan) by which our vision can be lived	July-December 2016 Done
Management and Division Boards (VI and JK) agree on APH operational budget 2017 and 2018	September 2016 Done
Science-Quality Committee <i>ad interim</i> completes advice report	October 2016 Done November
PhD/PD Committee <i>ad interim</i> completes advice report	October 2016 Done November
Each research program organized at least 1 program meeting	December 2016 Done
Promote and support high-risk or proof-of-concept studies in 1-2 programs	July-December 2016 Done in 1 program
Think Tank and External Advisory Board appointed and their (bi)annual meetings scheduled	October 2016 Done early 2017
Amsterdam Public Health first Annual Meeting	November 2016

	Done
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## Phase 2 (2017)

In 2017 the institute received continued support from the AMC/VUmc Boards (through the Division JK/VI Boards) to support its operational costs as well as 500k innovation funds. As in 2016, eighty percent of the yearly innovation funds (~400 k€) were used in the programs to support open calls for projects to increase (1) the scientific impact and (2) the societal/clinical impact of the APH institute. Twenty percent was used for high risk research of proof of concept studies in two APH programs.

The Division JK/EMGO+ funds were used for the institute's co-directors, the bureau (two policy part time workers and secretaries) to support:

- v. external communication (e.g. provide starting content and daily update new APH website);
- vi. two committees operationalize the structure for research quality and PhD-PD committees and prepare for implementation in 2018;
- vii. run the eight program councils led by two Program Directors;
- viii. organize the second Amsterdam Public Health Annual Meeting (60 k€).

In addition, in April, a dedicated junior Business Developer started (0.5 fte) and in October the Quality Officer (0.8 fte started).

Deliverables 2017	Timeline
Inventory of existing and to be supported cohorts and methodology infrastructure	January 2017 Done October
Annual Report Amsterdam Public Health	March 2017 postponed
Formation of the PhD-PD committee and the Science-Quality committee. Both committees start operationalizing the plans as prepared by the management based on the advices from 2016.	First trimester 2017 Committees started late Summer 2017
Annual meeting Amsterdam Public Health	Autumn 2017 Done November 2017
Presentation of the programs' plans and budgets for 2018 and further, for approval by the Board of Deans and Division Heads.	November 2017 Meeting for budgets 2018 and scenarios 2019
A public-private partnering strategy in conjunction with Innovation Exchange Amsterdam is formulated by a dedicated junior business developer	March 2017 Done Fall 2017
Long term strategy for joint housing in a Public Health building	December 2017 Will be postponed
Promote and support high-risk or proof-of-concept studies in 2 programs	2017 Done for 3 programs
An annual event for the PhD students in the institute	2017 Done (CaRe meeting)
Scientific and grant-coordination events in every research program	2017 Done
Start meetings with boards and researchers to explore	2017

collaboration with FMG (UvA) and GGD Amsterdam in APH	Done
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### Phase 3 (2018-2019)

The expectation is that both VU and UvA Faculties other than the faculties of Medicine will wish to continue their successful participation in APH. The Board of Deans will negotiate for 2019, based on the percentage of APH researchers stemming from UvA/VU/UMCA a fee for the participating VU/UvA Faculties to match the central support of the operational costs as was supplied by the faculties of Medicine for 2016, 2017 and 2018. In addition to the costs of the first 3 years, for quality control, internal and external visibility, and support of acquisition, talent development, and societal and economic valorization, we estimate to need an additional ~80 k€, and for funding for its cohorts infrastructure and funding to increase scientific and societal impact, we estimate to need an additional ~260 k€.

Deliverables 2018	Timeline
Develop and spread tailored information to communicate the identity and scientific and societal added value of APH to different stakeholders, such as researchers, funding agencies, potential business partners, patients, care providers and policy makers.	Spring 2019
Implement and maintain infrastructure to provide steering information for APH directors and to be accountable towards APH partners and external auditors.	Spring 2018
Annual Report suiting the demands of the Board of Deans	Spring 2018
Promote and support high-risk or proof-of-concept studies in 2 programs	Before spring 2018
An annual event for the PhD students in the institute	Summer 2018
3-4 scientific and/or grant-coordination events in every research program	2018
Project plan and budget for 2019	October 2018
Develop a strategic plan to expand and renew existing VU-VUmc funding for cohorts and methodology infrastructure to AMC-UvA partners	May 2018
Build an educational track for our PhD and post-doc researchers (2017)	June 2018
Support the unique expertise and resources within the institute	October 2018
Quality of research system is implemented in all programs	June 2018
PhD-PD committee is implemented in all programs	June 2018
Formalize collaboration with FMG (UvA) and GGD Amsterdam in APH	Summer 2018

<b>Deliverables 2019</b>	<b>Timeline</b>
Develop and spread tailored information to communicate the identity and scientific and societal added value of APH to different stakeholders, such as researchers, funding agencies, potential business partners, patients, care providers and policy makers.	Spring 2019
Implement and maintain infrastructure to provide steering information for APH directors and to be accountable towards APH partners and external auditors.	Spring 2019
Promote and support high-risk or proof-of-concept studies in 2 programs	Before spring 2019
Annual Report suiting the demands of the Board of Deans	Spring 2019
An annual event for the PhD students in the institute	Summer 2019
Scientific and grant-coordination events in every research program	2019
Strategic project plan and budget for the term 2020-2024	October 2019
Live the strategy for funding cohorts and methodology infrastructure	2019
Support the unique expertise and resources within the institute	2019
Mid-term (SEP) evaluation of the institute	Fall 2019

## Appendices

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### Appendix A: Directors and Program Leaders

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Management	Name	Email
<b>Directors</b>	Martine de Bruijne	<a href="mailto:mc.debruyne@vumc.nl">mc.debruyne@vumc.nl</a>
	Judith Sluiter	<a href="mailto:j.sluiter@amc.nl">j.sluiter@amc.nl</a>
<b>Management support</b>	Evelien de Boer	<a href="mailto:e.deboer@vumc.nl">e.deboer@vumc.nl</a>
	Corien Meijer (supported by several secretaries)	<a href="mailto:c.meijer@amc.uva.nl">c.meijer@amc.uva.nl</a>

Research program	Program Leaders	Email
<b>Health Behaviors &amp; Chronic Diseases</b>	Karien Stronks	<a href="mailto:k.stronks@amc.uva.nl">k.stronks@amc.uva.nl</a>
	Mai Chin A Paw	<a href="mailto:m.chinapaw@vumc.nl">m.chinapaw@vumc.nl</a>
<b>Mental Health</b>	Brenda Penninx	<a href="mailto:b.penninx@vumc.nl">b.penninx@vumc.nl</a>
	Mirjam Sprangers	<a href="mailto:m.a.sprangers@amc.uva.nl">m.a.sprangers@amc.uva.nl</a>
<b>Societal Participation &amp; Health</b>	Monique Frings-Dresen	<a href="mailto:m.frings@amc.nl">m.frings@amc.nl</a>
	Allard van der Beek	<a href="mailto:a.vanderbeek@vumc.nl">a.vanderbeek@vumc.nl</a>
<b>Global Health</b>	Frank Cobelens	<a href="mailto:f.cobelens@aighd.com">f.cobelens@aighd.com</a>
	Jacqueline Broerse	<a href="mailto:j.e.w.broerse@vu.nl">j.e.w.broerse@vu.nl</a>
<b>Aging &amp; Later Life</b>	Nathalie van der Velde	<a href="mailto:n.vandervelde@amc.uva.nl">n.vandervelde@amc.uva.nl</a>
	Cees Hertogh	<a href="mailto:cmpm.hertogh@vumc.nl">cmpm.hertogh@vumc.nl</a>
<b>Quality of Care</b>	Sophia Kramer	<a href="mailto:se.kramer@vumc.nl">se.kramer@vumc.nl</a>
	Michèle van Vugt	<a href="mailto:m.vanvugt@amc.uva.nl">m.vanvugt@amc.uva.nl</a>
<b>Personalized Medicine</b>	Meike Bartels	<a href="mailto:m.bartels@vu.nl">m.bartels@vu.nl</a>
	Dick Willems	<a href="mailto:d.l.willems@amc.nl">d.l.willems@amc.nl</a>
<b>Methodology</b>	Hans Berkhof	<a href="mailto:h.berkhof@vumc.nl">h.berkhof@vumc.nl</a>
	Mariska Leeflang	<a href="mailto:m.m.leeflang@amc.uva.nl">m.m.leeflang@amc.uva.nl</a>

## Appendix B: Research Council per program (May 2017)

Research program	Research Council members	Email
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## Appendix D: External Advice Board

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The external advisory board started Spring 2017 and the current members, are:

<b>Name</b>	<b>Affiliation, job title</b>
A.M.P. (Annemiek) van Bolhuis, MBA	Rijksinstituut voor Volksgezondheid en Milieu (RIVM), director Public Health & Care
prof. R.C.M.E. (Rutger) Engels, PhD	Trimbos Instituut, CEO
prof. L.J. (Louise) Gunning-Schepers, PhD	National Science Agenda (NWA), chair
A. (Aad) Koster, M.Sc.	Organisatie voor Vitaliteit, Activering en Loopbaan (OVAL), Director
prof. J.A. (André) Knottnerus, MD, PhD	Wetenschappelijke Raad voor het Regeringsbeleid (WRR), chair
H.P. (Petrien) Uniken-Venema , PhD	Netherlands School of Public and Occupational Health (NSPOH), Director
D.A. (Dianda) Veldman, M.Sc.	Patiëntenfederatie Nederland, Director-board member
P. (Paul) van der Velpen, M.Sc.	GGD Amsterdam / Public Health, (ex)director