Registration requirements for Epidemiologist A and B

Epidemiology is the scientific discipline which studies the occurrence and distribution of diseases and health indicators in human populations in relation to the factors affecting these. Epidemiological research fosters the development of public health and clinical health care.

Registration requirements for Epidemiologist A

Candidates for registration as an Epidemiologist A must meet the following requirements:

(=>detailed information on the specific requirements is presented below)

A. <u>Pre-training (formally foundation degree) with sufficient content concerning health and disease</u>

B. <u>Training in epidemiological methods (60 ECs)</u>

1. Basic knowledge of epidemiological methods (15 ECs, of which at least 10 ECs at MSc level)
2. Practical experience in epidemiology (25 ECs, MSc level)
3. Advanced epidemiological knowledge (5 ECs, MSc level)
4. Elective component (theoretical and/or practical experience) (15 ECs, MSc level)

Registration requirements for Epidemiologist B

Candidates for registration as an Epidemiology Scientific Researcher (Epidemiologist B) must meet all requirements stated for registration as an Epidemiologist A.

Additionally, they must meet the following additional requirements:

(=>detailed information on the specific requirements is presented below)

C. <u>Completion of PhD</u>

D. <u>Epidemiological publications</u>

E. <u>Epidemiological supervision</u>

F. <u>Epidemiological portfolio</u>

EC = European Credits. 1 EC is equivalent to 28 study load hours.

Detailed information on the requirements for Epidemiologist A

A. Pre-training (formally foundation degree) with sufficient content concerning disease and health

The pre-training must consist of a completed university or higher vocational programme, at least at the Bachelor's level.

Please indicate in your application the programme followed and send a copy of your diploma.

- Human Movement Sciences
- Biology
- Biomedical Sciences
- Veterinary Medicine
- Pharmaceutical and chemical Sciences
- Medicine
- Health Sciences
- Biostatistics
- Bachelor Dietetics
- Bachelor Occupational Therapy
- Bachelor Physiotherapy
- Bachelor Medical Laboratory Research
- Bachelor Midwifery
- Bachelor Nursing
- Medical Biology
- Medical Informatics
- Health Technology
- Clinical Technology
- Psychology
- Dentistry
- Nutritional Sciences

* These programmes are based on those known in the Netherlands and Belgium. If a programme is not mentioned here but seems to fit in one of them, a recognized educator (appointed by the Netherlands Epidemiology Society (VvE)) should be asked to confirm that it is the right foundation degree.

Basic medical knowledge

With or in addition to these programmes, the candidate must show through certificates and/or diplomas that he/she took at least 8 ECs in courses about disease and health at least at the Bachelor's level. This requirement relates to the following aspects:

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General knowledge of disease and health
Normal versus pathological human physiological and biological processes; corner stones of medical action, i.e. diagnosis (medical history taking, physical examination, additional diagnostics), therapeutic options and prognosis; medical terminology; complexity of and relationship between disease categories; and insight into the role and function of different specialisms.

Specific knowledge of disease and health
Medical aspects of specific illnesses both at the population level (risk indicators, prevention, prevalence/incidence, trends) and at the individual patient level – detailed for several illnesses and more general for the other ones.

Explicitly the above-mentioned learning outcomes involve, on top of basic knowledge such as the frequency of illness in a patient or general population, knowledge of the aetiology, pathogenesis, diagnostics, prognostics and the intentional (and unintentional) effects of medical interventions (therapy, rehabilitation, and primary, secondary and tertiary prevention). This specification applies to major illnesses such as cancer, cardiovascular diseases, infectious diseases, neurological disorders, locomotor diseases and injuries, and so forth. Knowledge about merely, e.g. anatomy (or anatomopathology) and physiology (or physiopathology) concerning disorders of one single medical (or paramedical) specialism or one major determinant (such as nutrition or physical activity) will not be enough.

A Bachelor's programme in Medicine will automatically meet the stated requirements regarding basic medical knowledge.

Other pre-training

Candidates who have taken other foundation degree programmes (national or international, at least at the Bachelor's level) beside those mentioned above may only obtain registration in exceptional cases. They should timely contact a recognised educator to formulate an additional training programme with sufficient content concerning disease and health. Moreover, the candidate must demonstrate to have at least three years of working experience in a biomedical and epidemiological setting, with active participation in work discussions, journal clubs and so on. The recognised educator will evaluate whether this work experience is sufficient and in line with the registration requirements.

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B. Training in epidemiological methods (60 ECs)

For recognised Dutch programmes in epidemiological methods (for the most recent status, see www.epidemiologie.nl), mentioning of the programme's name will be sufficient. Please send a copy of the diploma, along with an overview of the courses/subjects taken and the number of ECs per course.

For non-recognised programmes in epidemiology, the candidate must show through certificates and diplomas that he/she has fulfilled the learning outcomes mentioned in B.1, with a detailed description of the content and duration of the courses taken, as well as the number of credits per course. The candidate is advised to timely contact a recognised educator to work out the training program.

All of the courses taken must have had assessed at the individual level; only a certificate of attendance will not be sufficient. The candidate needs to have passed the assessment for each course.

1. Learning outcomes for basic knowledge of epidemiological methods

(15 ECs, at least 10 ECs at the MSc level)

This pertains to **having knowledge of, having an understanding of and being able to work with**:

a) epidemiological measures for the occurrence of events and states, measures of association and measures of effect;
b) epidemiological study designs such as cross-sectional studies, case-control studies, cohort studies, and randomized trials;
c) epidemiological research domains such as aetiology, diagnosis, prognosis and therapy;
d) collection, processing and storing data;
e) characteristics and quality of measurement instruments and measurement- and analysis methods;
f) such terms as randomisation, causality, effect modification, confounding, generalisation, precision, validity and bias;
g) basic epidemiological methods such as patient-year analysis, the use of life tables and methods for adjustment of confounding, such as stratification and standardisation (direct and indirect);
h) basic statistics, including distributions, simple statistical tests, p-value and confidence interval;
i) multiple regression and survival analysis.

The candidate must have taken courses about the above-mentioned concepts and be able to explain, apply and use them in epidemiological research. The candidate must be able to independently perform analyses and interpret and present analysis results.

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2. Practical experience in epidemiology

(25 ECs, MSc level)

The candidate must have applied theoretical epidemiology and statistics in a sufficiently independent manner (usually during an internship). Merely being an executive part of a project and using only descriptive statistics is not sufficient. The internship supervisor must be at least a registered Epidemiologist A or similar. The candidate has written an individual final report, preferably in the form of a scientific publication.

The final report must show sufficient epidemiological work, that is, the report must contain more than just descriptive information. There needs to be a well-founded epidemiological research question, an appropriate research design and proper data analysis. This may take the form of a systematic review or an aetiological, diagnostic, prognostic or therapeutic study.

The candidate will mention the subject, the start and end date of the research project, the supervisor's name(s) and epidemiological expertise (registration as an Epidemiologist A or B, or a brief curriculum vitae and/or list of publications) and the name of the organisation where the candidate performed the practical work. The candidate will send a digital copy of the final report.

3. Advanced epidemiological knowledge

(5 ECs, MSc level)

In addition to the requirements stated under 'Basic knowledge of epidemiological methods', the candidate must select one or more advanced epidemiological topics, taking at least 5 ECs in courses related to these. This may involve epidemiological specialist areas (see examples below) or advanced epidemiological methods. These advanced topics and the number of ECs per course must be clearly described. The candidate must demonstrate through certificates and diplomas with a satisfactory assessment that he/she has fulfilled the stated learning outcomes.

Examples of subjects for more advanced study include:

Specialist areas:	such as genetic epidemiology, nutritional epidemiology, pharmaceutical epidemiology, public health epidemiology, etc.;
Illnesses:	such as diabetes epidemiology, infectious disease epidemiology, cancer epidemiology and the like;
Methodology:	such as an advanced course in clinimetrics, multilevel analysis, longitudinal data analysis, competing risk analyses, etc.

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4. **Elective component** (theoretical and/or practical experience)
(15 ECs, MSc level)

The candidate may fill the remaining 15 ECs with:

- extra epidemiological practical experience (see (2))
  This must include **extra** practical experience, that is, relating to a **different topic** than the practical experience mentioned under (2). The extra practical experience will be obtained within a programme and under supervision of at least a registered Epidemiologist A or similar. For a further description, see (2).

- an extra epidemiological/methodological topic for advanced study (see (3)).

- writing an epidemiological/methodological essay
  The candidate must indicate the subject, the supervisor's name(s) and the name of the organisation where the candidate wrote this essay. The candidate will send a digital copy of the essay.

- providing epidemiological teaching
  The epidemiological teaching provided needs to be specified in terms of the epidemiological level, topics discussed and number of hours of face-to-face teaching. This teaching portfolio must be signed by the responsible lecturer.

- theoretical training in a topic related to epidemiology (such as health technology assessment or epidemiology and policy (at most 5 ECs).

The candidate must describe how the elective component has been completed and show that he/she has fulfilled the stated learning objectives associated with each element.

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Detailed information on the requirements for Epidemiologist B

Registration as an Epidemiology Scientific Researcher (Epidemiologist B) will occur at the Foundation for Biomedical Scientific Research Training (SMBWO). The application will be submitted through the Netherlands Epidemiology Society (VvE).

Candidates for registration as an Epidemiology Scientific Researcher (Epidemiologist B) must meet all requirements stated for registration as an Epidemiologist A. Moreover, they must meet the additional requirements stated below.

A candidate already registered as an Epidemiologist A, can indicate his/her A-registration number and the procedure is limited to fulfilment of the additional registration requirements for an Epidemiology Scientific Researcher (Epidemiologist B).

C. Completion of PhD

The candidate must indicate the title of the PhD thesis, the university from which the PhD degree was obtained and the PhD thesis supervisor(s). The candidate must also provide a brief description of his/her PhD research (summary) and send a copy of the diploma. A PhD obtained in a foreign country will be valid, too.

D. Epidemiological publications

The candidate must have published at least four scientific papers (A1) as the first author, or three papers as the first author and two papers as a co-author, in recognised international and peer-reviewed scientific journals.

All of the publications listed must be sufficiently epidemiological in nature, that is, the publications must contain more than just descriptive information. There needs to be a well-founded epidemiological research question, an appropriate research design and proper data analysis. This may take the form of a systematic review or an aetiological, diagnostic, prognostic or therapeutic study. The publications must be sufficiently varied in terms of type of research question, methodology, research design, and advanced or other analysis methods.

E. Epidemiological supervision

The candidate must have worked under the supervision of a registered Epidemiologist B for at least one year; this person may be the thesis supervisor, thesis co-supervisor or day-to-day supervisor. The applicant must indicate which supervisor is registered as an Epidemiologist B. For an international PhD degree, the supervision needs to have taken place by an epidemiologist equivalent to an Epidemiologist B.

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F. Epidemiological portfolio

During the training period, the candidate must demonstrably keep up with epidemiological developments through attending conferences, giving lectures, providing epidemiological teaching, taking advanced epidemiological courses and participating in epidemiological journal clubs and seminars. The candidate needs to build up a portfolio equalling at least 5 ECs. The portfolio will contain proof of participation in seminars, journal clubs and conferences, certificates from the courses taken, information about the teaching provided (which courses and specification of the tasks) and proof of oral presentations. The various elements must be sufficiently varied.

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