

## 2025 Akita University Faculty of Medicine Syllabus

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| <b>Category</b>          | : 医療・社会・行動科学 III                                                |
| <b>Course Title</b>      | : Epidemiology and Preventive Medicine - ヒト集団の健康問題に関する因果関係の推定 - |
| <b>Eligible Students</b> | : grade 3 Related Course                                        |
| <b>Code</b>              | : 71583005                                                      |
| <b>Schedule</b>          | : week 16                                                       |
| <b>Credits</b>           | : 1                                                             |

### 1. Lead Instructor

Kyoko Nomura (Professor, Department of Environmental health science and Public Health, 6086)

### 2. Instructors

Kyoko Nomura (Professor, Department of Environmental health science and Public Health, 6086)  
Songee Jung (Assistant Professor, Department of Environmental health science and Public Health, 6088)  
Teiichiro Yamazaki (Assistant Professor, Department of Environmental health science and Public Health, 3260)  
Masahiro Iwakura (Assistant Professor, Department of Environmental health science and Public Health, 7032)

### 3. Course Description Outline(Course Objectives)

#### 【ねらい】

臨床現場で必要となる各疾患の病態を習得して診療を実践していくために、保健医療での意思決定において、入手可能な最善の医学知見を用い、適切な意思決定を行うための方法を身に付ける。保健統計の意義と現状、疫学とその応用、疾病の予防について学ぶ。

地域医療・地域保健の在り方と現状及び課題を理解し、地域医療に貢献するための能力を獲得する。

医学、生物学でよく遭遇する標本に統計手法を適用するときに生じる問題点、統計パッケージの利用を含めた具体的な扱い方を修得する。

また、関連するプロフェッショナリズム、倫理、医療行動科学、医療安全、医療法（制度）、EBM 等について学ぶ。

3-3～7, 5-1～5

#### 【授業の概要】

保健統計の意義と現状、疫学とその応用、疾病の予防について習得する。

関連するプロフェッショナリズム、医の倫理、医療安全、医療法（制度）、EBM について説明できる。

#### 【Aim】

To acquire the best available medical knowledge and methods for making appropriate decisions in health-care decision-making, in order to master the pathophysiology of each disease and practice medical treatment required in clinical practice. To learn about the significance and the status of health statistics, epidemiology and its application, and disease prevention.

To be capable of contributing to community healthcare by understanding the modality, current situation, and challenges of community healthcare.

To learn the problems that arise when applying statistical methods to specimens commonly encountered in medicine and biology, and how to deal specifically with them, including the use of statistical packages.

In addition, students will learn about related topics such as professionalism, ethics, medical behavioral science, medical safety, medical law (system), EBM, etc.

3-3～7, 5-1～5

#### 【Class Outline】

To learn about the significance and status of health statistics, epidemiology and its application, and disease prevention.

Students will be able to explain relevant professionalism, medical ethics, medical safety, medical law (system), and EBM.

#### 4. Textbook/Reference Books

疫学 - 医学的研究と実践のサイエンス (メディカル・サイエンス・インターナショナル、2010 年)  
医学的研究のデザイン - 推論の質を高める系統的アプローチ - (第 5 版、2024 年)  
NEW 予防医学・公衆衛生学 (改訂版第 4 版、南江堂、2018 年)  
国民衛生の動向 (厚生統計協会、2024/2025 年度版)  
職業・環境がんの疫学 (篠原出版新社、2004 年)  
シンプル衛生公衆衛生学 (南江堂、2023 年版)  
公衆衛生がみえる (MEDIC MEDIA、2024-2025)

#### 5. Assessment

統一試験、形成評価 (60%未達の場合は課題を課す)

Comprehensive examination, formative assessment (additional assignment will be given when a total score of 60% is not achieved)

#### 6. Out of Class Study/Message

最後の講義時間に形成試験を行うので、配布資料や教科書を参考に予習・復習を行うこと。

「医学統計・保健統計演習」の講義では統計ソフト R を使用しながら講義を行う。可能であれば、<https://ftp.yz.yamagata-u.ac.jp/pub/cran/>から R をダウンロードしたノート PC を持参することを勧める。

Preparations and reviews should be made with reference to distributed materials and textbooks since formation tests are conducted during the final lecture period.

In the lecture on “ Medical Statistics and Health Statistics, ” lectures are given using Statistical Software R.

If feasible, it is recommended to bring a notebook PC downloaded from the <https://ftp.yz.yamagata-u.ac.jp/pub/cran/>.

| Topics and Contents of class, Course Objectives |              |        |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                  |
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|                                                 | Class Date   | Period | Class Format | Topics and Contents of class, Course Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Instructors        | Class Room       |
| 1                                               | 8 / 25 (Mon) | 1-4    | Lecture      | <p>Theme: 公衆衛生学概論 Introduction to public health</p> <p>1) 基本概念 (国民健康づくり運動、生活習慣病とリスクファクター、健康寿命の延伸と生活の質 (quality of life <b>QOL</b>) 向上、行動変容、健康づくり支援のための環境整備等) を説明できる。</p> <p>2) 予防医学 (一次、二次、三次予防) と健康保持増進 (健康管理の概念・方法、健康診断・診査と事後指導) を概説できる。</p> <p>1) Basic concepts (national health promotion campaigns, lifestyle-related diseases and risk factors, extension of healthy life expectancy and improvement of quality of life (quality of life), behavioral change, and environmental improvement for health promotion support, etc.) can be explained.</p> <p>2) Preventive medicine (primary, secondary, and tertiary prevention) and health maintenance and promotion (concepts and methods of health management, medical examinations, examinations, and follow-up guidance) can be outlined.</p> | Masahiro Iwakura   | 医学系研究棟 4 階 6 講義室 |
| 2                                               | 8 / 25 (Mon) | 5-10   | Lecture      | <p>Theme: 疫学指標 Epidemiological index</p> <p>罹患率と発生割合の違いを説明できる。</p> <p>疫学とその応用 (疫学の概念、疫学指標 (リスク比、リスク差、オッズ比) とその比較 (年齢調整率、標準化死亡比 (standardized mortality ratio <b>SMR</b>))、バイアス、交絡) を説明できる。</p> <p>The difference between incidence and proportion can be explained.</p> <p>Epidemiology and its application (epidemiological concepts, epidemiological indicators (risk ratios, risk differences, odds ratios) and their comparison (age-adjusted mortality ratios, standardized mortality ratios <b>SMR</b>), bias, and confounding) can be explained.</p>                                                                                                                                                                                                                                            | Songee Jung        | 医学系研究棟 4 階 6 講義室 |
| 3                                               | 8 / 26 (Tue) | 1-4    | Lecture      | <p>Theme: 研究デザイン Study design</p> <p>根拠に基づいた医療 <b>EBM</b> の 5 つのステップを列挙できる。</p> <p>研究デザイン (観察研究 (記述研究、横断研究、症例対照研究、コホート研究)、介入研究 (臨床研究、ランダム化比較試験)、システマティックレビュー、メタ分析 (メタアナリシス) を概説できる。</p> <p>The five steps of evidence-based medicine <b>EBM</b> can be enumerated.</p> <p>Study design (observational studies (descriptive studies, cross-sectional studies, case-control studies, cohort studies), intervention studies (clinical studies, randomized controlled trials), systematic reviews, and meta-analyses (meta-analyses) can be outlined.</p>                                                                                                                                                                                                                                                  | Teiichiro Yamazaki | 医学系研究棟 4 階 6 講義室 |

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| 4                                               | 8 / 26 (Tue) | 5-8    | Lecture      | <p>Theme: 偏り・交絡・偶然性・因果関係 bias, confounding, chance, and causality<br/>疫学とその応用（疫学の概念、疫学指標（リスク比、リスク差、オッズ比）とその比較（年齢調整率、標準化死亡比 (standardized mortality ratio <b>SMR</b>)、バイアス、交絡）を説明できる。</p> <p>Epidemiology and its application (epidemiological concepts, epidemiological indicators (risk ratios, risk differences, odds ratios) and their comparison (age-adjusted mortality ratios, standardized mortality ratios <b>SMR</b>), bias, and confounding) can be explained.</p>                                            | Songee Jung  | 医学系研究棟 4 階 6 講義室 |
| 5                                               | 8 / 26 (Tue) | 9-10   | Exercise     | <p>Theme: 疫学と予防医学 Epidemiology and Preventive Medicine</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Songee Jung  | 医学系研究棟 4 階 6 講義室 |
| 6                                               | 8 / 27 (Wed) | 1-2    | Lecture      | <p>Theme: 過重労働とメンタルヘルス Overwork and mental health<br/>休養・こころの健康（睡眠の質、不眠、ストレス対策、過重労働対策、自殺予防）を説明できる。</p> <p>Students will be able to explain the relationship between rest and mental health (quality of sleep, insomnia, stress prevention, overwork prevention, and suicide prevention).</p>                                                                                                                                                                                                                            | Kyoko Nomura | 医学系研究棟 4 階 6 講義室 |
| 7                                               | 8 / 27 (Wed) | 3-4    | Lecture      | <p>Theme: 検査の疫学 Epidemiology of testing<br/>臨床検査の特性（感度、特異度、偽陽性、偽陰性、検査前確率（事前確率）・検査後確率（事後確率）、尤度比、receiver operating characteristic <b>ROC</b> 曲線）と判定基準（基準値・基準範囲、カットオフ値）を説明できる。</p> <p>Laboratory characteristics (sensitivity, specificity, false-positive, false-negative, pre-test probability), post-test probability (posterior probability), likelihood ratio, receiver operating characteristic <b>ROC</b> curve) and acceptance criteria (baseline, reference range, cut-off value) can be explained.</p>          | Kyoko Nomura | 医学系研究棟 4 階 6 講義室 |
| 8                                               | 8 / 27 (Wed) | 5-6    | Lecture      | <p>Theme: 医療経済 Healthcare economy<br/>日本における社会保障制度と医療経済（国民医療費の収支と将来予測）を説明できる。<br/>医療における費用対効果分析を説明できる。<br/>医療資源と医療サービスの価格形成を説明できる。診療報酬制度を説明でき、同制度に基づいた診療計画を立てることができる。</p> <p>The social security system and the healthcare economy in Japan can be explained.<br/>The cost-effectiveness analysis in healthcare can be explained.<br/>It explains the pricing of health care resources and services. The reimbursement system can be explained and a medical treatment plan can be formulated based on this system.</p> | Kyoko Nomura | 医学系研究棟 4 階 6 講義室 |

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| 9                                               | 8 / 27 (Wed) | 7-8    | Lecture      | <p>Theme: 健康の社会的決定因子 Social determinants of health<br/>社会構造（家族、コミュニティ、地域社会、国際化）と健康・疾病との関係（健康の社会的決定要因（social determinants of health））を概説できる</p> <p>The relationship between social structure (family, community, internationalization) and health and disease (social determinants of health) can be outlined.</p>                                                                                                                                                                                                                                      | Teiichiro Yamazaki | 医学系研究棟 4 階 6 講義室 |
| 10                                              | 8 / 27 (Wed) | 9-10   | Lecture      | <p>Theme: 医学論文の読み方 How to read medical articles<br/>Patient, population, problem, intervention (exposure), comparison, outcome <b>PICO (PECO)</b> を用いた問題の定式化ができる。<br/>データベースや二次文献からのエビデンス、診療ガイドラインを検索することができる。<br/>得られた情報の批判的吟味ができる。</p> <p>The problem can be formulated using Patient, Population, Problem, Intervention (exposure), Comparison, and Outcome <b>PICO (PECO)</b>.<br/>Evidence from databases and secondary literature and practice guidelines can be searched.<br/>Critical examination of the information obtained is possible.</p> | Teiichiro Yamazaki | 医学系研究棟 4 階 6 講義室 |
| 11                                              | 8 / 28 (Thu) | 1-4    | Lecture      | <p>Theme: 保健統計 Health statistics<br/>人口統計（人口静態と人口動態） 疾病・障害の分類・統計（国際疾病分類 (International Classification of Diseases <b>ICD</b>) 等）を説明できる。平均寿命、健康寿命を説明できる。<br/>Demographics, classification and statistics of diseases and disability (International Classification of Diseases <b>ICD</b>) can be explained. Average life expectancy and healthy life expectancy can be explained.</p>                                                                                                                                                                   | Kyoko Nomura       | 医学系研究棟 4 階 6 講義室 |

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| 12                                              | 8 / 28 (Thu) | 5-10   | Lecture      | <p>Theme: 医学統計・保健統計演習 Medical Statistics and Health Statistics Exercise</p> <p>データの記述と要約（記述統計を含む）ができる。</p> <p>主要な確率分布を説明できる。</p> <p>正規分布の母平均の信頼区間を計算できる。</p> <p>基本的な仮説検定の構造を説明できる。</p> <p>2 群間の平均値の差を検定できる（群間の対応のあり、なしを含む）。</p> <p>パラメトリック検定とノンパラメトリック検定の違いを説明できる。</p> <p>カイ 2 乗検定法を実施できる。</p> <p>一元配置分散分析を利用できる。</p> <p>2 変量の散布図を描き、回帰と相関の違いを説明できる。</p> <p>線形重回帰分析、多重ロジスティック回帰分析と交絡調整を概説できる。</p> <p>Data descriptions and summaries (including descriptive statistics) can be made.</p> <p>The primary probability distribution can be explained.</p> <p>The confidence interval of the population mean of the normal distribution can be calculated.</p> <p>The structure of the basic hypothesis test can be explained.</p> <p>Differences in mean values between the two groups can be tested (with and without matching between groups).</p> <p>The difference between parametric and nonparametric tests can be explained.</p> <p>The chi-square test can be performed.</p> <p>One-way analysis of variance can be used.</p> <p>A two-variate scatter plot can be drawn to explain the differences in regression and correlation.</p> <p>Linear multiple regression analysis, multiple logistic regression analysis, and confounding adjustment can be outlined.</p> | Kyoko Nomura | 医学系研究棟 4 階 6 講義室 |
| 13                                              | 8 / 29 (Fri) | 1-4    | Lecture      | <p>Theme: 職業癌の疫学 Epidemiology of occupational cancer</p> <p>疫学が職業がんの原因解明に寄与した事例、および現代行われている体系的な発がん性環境因子の検索を紹介する。</p> <p>As examples for application of epidemiology, this lecture introduces (1) classical epidemiological studies searching for occupational factors that cause cancers and (2) modern systematic attempts to review carcinogenicity of vast environmental factors.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Songee Jung  | 医学系研究棟 4 階 6 講義室 |

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| 14                                              | 8 / 29 (Fri) | 5-6    | Lecture             | <p>Theme: 地域保健医療 Community health care</p> <p>1. 医療計画（医療圏、基準病床数、地域医療支援病院、病診連携、病病連携、病院・診療所・薬局の連携等）及び地域医療構想を説明できる。</p> <p>2. 地域における救急医療体制を説明できる。</p> <p>1. Medical plans (medical zones, standard hospital beds, community medical support hospitals, hospital collaborations, hospital collaborations, cooperation among hospitals, and cooperation between hospitals, clinics, and pharmacies, etc.) and community medical plans can be explained.</p> <p>2. Students will be able to explain the emergency medical system in the region.</p> | Teiichiro Yamazaki                                                    | 医学系研究棟 4 階 6 講義室 |
| 15                                              | 8 / 29 (Fri) | 7-8    | Self learning       | <p>Theme: 疫学と予防医学 Epidemiology and Preventive Medicine</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Songee Jung<br>Teiichiro Yamazaki<br>Masahiro Iwakura                 | 医学系研究棟 4 階 6 講義室 |
| 16                                              | 8 / 30 (Sat) | 9-10   | Formative assesment | <p>Theme: 終了時客観試験 Objective test at the end</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Kyoko Nomura<br>Songee Jung<br>Teiichiro Yamazaki<br>Masahiro Iwakura | 医学系研究棟 4 階 6 講義室 |