ORIGINAL ARTICLE

# A Participatory Approach to Determining the Appropriate Medical Examination Requirements for Employment in an Urban Setting in the Philippines

Jhason John J. Cabigon, MD,[1*] Lea Elora A. Conda, MD, MBA,[1*]
Celin Audrey V. Nuñez,[1] Dana Sophia Elizandra T. Uy,[1]
Catherine S. Artaiz-Cariaga, MD[2] and Geminn Louis C. Apostol, MD, MBA, MSc, PhD(c)[1]

*[1]Center for Research and Innovation, Ateneo School of Medicine and Public Health, Pasig City, Philippines*
*[2]Philippine College of Occupational Medicine (PCOM) Quezon City Chapter, Quezon City, Philippines*

## ABSTRACT

**Background and Objective.** Evidence base on employment-related medical examinations is highly variable. The aim of this study is to build expert agreement on the appropriate medical and laboratory tests in major industries in Quezon City.

**Methods.** An initial scoping review of local, national, and international policies on employment-related diagnostic testing was done. The determination of industries at the selected study site (Quezon City) was accomplished through Pareto analysis. Interviews of key informants and representatives, and a consensus-building process through an expert panel were carried out by the Philippine College of Occupational Medicine (PCOM) Quezon City Chapter. Data gathered was used in the study and analyzed. An initial list of medical tests and diagnostics was drafted and the Modified RAND appropriateness method was used as the choice of mixed methods consensus-building process by an expert panel.

**Results.** Regulations often vary significantly within settings and implementers, particularly the scope, content, and procedures for medical examinations of workers. History taking (including occupational history) and physical examination are the cornerstones of the screening process. CBC and chest x-ray were deemed appropriate screening laboratory tests for asymptomatic pre-employment examination, while only chest x-rays were used during periodic examinations. Additional tests for medical surveillance should be based on job demands and specific exposure. For specific chemical exposure, standard references for medical requirements, like from Occupational Safety and Health Administration (OSHA), can be referred to.

**Conclusion.** A shift in how occupational health and safety measures are implemented is needed, particularly in the pre-employment and periodic examination practices, for more relevant screening while preventing unnecessary and low-yield testing and reducing costs for the employer and the employee. An occupational screening checklist/questionnaire based on the results of the study that includes appropriate clinical history-taking, review of systems (ROS), physical examination, and laboratories must be devised, which is to be followed by training in the proper conduction of these medical assessments.

*Keywords: occupational medicine, occupational health, public health, preventive medicine*

** Dr. Cabigon and Dr. Conda shared first authorship for this manuscript.*

Corresponding author: Lea Elora A. Conda, MD, MBA
Center for Research and Innovation
Ateneo School of Medicine and Public Health
Don Eugenio Lopez Sr. Medical Complex
Ortigas Avenue, Pasig City 1604, Philippines
Email: leaconda.md@gmail.com
ORCiD: https://orcid.org/0000-0001-7227-5570

## INTRODUCTION

Occupational health aims to promote and maintain the highest degree of physical, mental, and social well-being of workers in all occupations, to prevent decline in health caused by their working conditions, to protect workers in their employment from risks resulting from factors adverse to health, and to place and maintain workers in an occupational environment adapted to their physiological and psychological capabilities.[1] An essential function of occupational health is the conduct of medical examinations before, during, and after an employee enters a particular occupation.

Employment-related medical examinations (pre-, during, and post-) are widely practiced worldwide. However, their evidence base is extremely limited and are highly variable. National laws, regulations, and professional practice guidelines often vary significantly within and between countries, settings, and implementers. Unfortunately, pre-employment examinations are considered "more cultural than data-driven" and "driven by a compliance mentality."[2] The lack of standardized guidelines specifying which diagnostic procedures are appropriate for workers from various industries, categories of hazard exposures, and how often these screening and diagnostic procedures must be performed could create confusion among employers and employees, healthcare providers, and diagnostic clinics. It also undermines the effectiveness of medical surveillance in occupational settings. The absence of clear, evidence-informed standards makes it difficult to rationalize and update employment-related examinations. In the Philippines, existing practices continue to be influenced by traditional clinical models focused on general health checks, rather than targeted risk-based assessments. This results in outdated and fragmented approaches to occupational medical examinations.

The aim of this study is to build expert agreement on the appropriate medical and laboratory tests in major industries in Quezon City. Specifically, the study conducted a scoping review of local, national, and international policies and guidelines on employment-related diagnostic testing to clarify their purpose, scope, standards, accountabilities, and compliance monitoring mechanisms. It also evaluated the implementation fidelity of existing diagnostic testing practices in major industries in Quezon City. Finally, through a mixed methods consensus-building process using the modified RAND Appropriateness Method (RAM), which is typically used in the development of evidence-based clinical practice guidelines, the study facilitated agreement among experts on a standardized set of medical and laboratory tests deemed most appropriate for addressing significant occupational hazard exposures in the city. Using the mixed methods consensus-building process and applying the rules of the modified RAM, there will be a measurable level of expert consensus on a standardized set of medical and laboratory tests, which were identified during scoping review and key informant interviews, that are appropriate for workers across major industries in Quezon City.

## METHODS

### Study Design

The study is comprised of three phases. Phases 1 and 2, which comprised of a scoping review, key informant interviews, and an implementation fidelity approach, were used to assess exposures (e.g., industry categories and occupational risks), predictors (e.g., regulatory, cost, and policy factors), potential confounders (e.g., company size, resources, internal policies), and effect modifiers (e.g., industry-specific hazards). Phase 3 applied the modified RAM to establish the primary outcome of the study, which is an expert consensus on the appropriateness of medical and laboratory tests for pre-employment and periodic examinations. Diagnostic criteria were incorporated where relevant. The participatory approach was implemented by involving multiple stakeholders from selected industries and occupational health experts, allowing them to contribute to the development of recommendations for pre-employment (PEME) and annual physical examinations (APE).

A flowchart of the methodology is seen in Figure 1.

### Scoping Review

Document review and content analysis of existing local and national policies and guidelines on employment-related diagnostic testing was performed with close coordination among stakeholders and concerned agencies such as the Department of Health (DOH), Occupational Safety and Health Center (OSHC), and Department of Labor and Employment (DOLE). Systematic screening and selection of policies were done using an online search of high-level policy issuances, a keyword search in the policy databases of DOH-HPDPB (Health Policy Development and Planning Bureau) and OSHC. In parallel with the scoping of policy documents available locally, a benchmarking review of international guidelines and best practices was undertaken. The scoping review was done from June 2022 to December 2022.

### Identification of Study Site and Priority Industries

A single study site (Quezon City) was selected to examine the policy mechanisms identified in the preceding desk exercises, which were also manifested into practices when these policies were implemented in a locality. Quezon City was selected as the study site since it was identified as the city in the National Capital Region (NCR) with the most number of employees in the country.[3] The Implementation Fidelity Approach was used to compare what a policy achieves vis-a-vis what was intended and how it was implemented.

Determination of the study population and major industries was done through Pareto Analysis, which meant that, theoretically, the top 20% of industries will comprise already 80% of the total employee population.[4] The analysis

identified sectors with the highest concentration of workers, thereby ensuring that the study would capture practices affecting the majority of the labor force. Lists of companies under each major industry were acquired from the Philippine Statistics Authority (PSA), Quezon City Business Permits and Licensing Department (BPLD), and the Securities and Exchange Commission (SEC). In this study, seven industries were identified to include 80% of the total employment: Manufacturing, Wholesale and Retail Trade, Transportation and Storage, Accommodation and Food Service Activities, Financial and Insurance Activities, Administrative and Support Service Activities, and Education (Figure 2).

## Key informant Interviews and Mixed Methods Consensus-building Process

Interviews of key informants and representatives, and mixed methods consensus-building process through an expert panel was carried out by the Philippine College of Occupational Medicine (PCOM) Quezon City Chapter and data gathered was used in the study and analyzed. This phase of the study was done from January 2023 to December 2023.

Key informants were deliberately selected from among company representatives in the identified industries. Selection was guided by three main considerations: (1) that they were directly involved in decisions related to occupational health (e.g., chief executive officers, managers, human resource personnel, or occupational safety and health committee members); (2) that enterprises of different sizes (small, medium, and large) were represented; and (3) that they were willing to participate in the key informant interviews. In the end, nine companies agree to participate, representing the following industries: manufacturing, wholesale and retail trade, accommodation and food service, financial services, administrative and support services, and education. A summary of the distribution of participants is provided in Table 1.

Interviews were conducted and guided by several domains, such as company profile, workforce characteristics, occupational risks and hazards, existing practices in medical examinations, industry-specific exposures, and the conduct of examinations across different stages of employment.

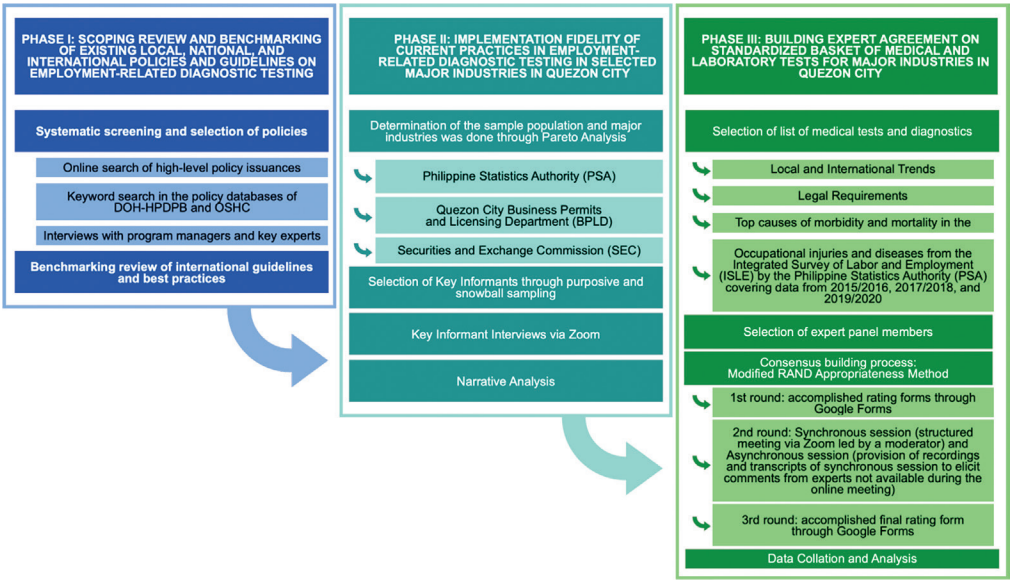


**Figure 1.** Flowchart of the study methodology.

**Table 1.** Distribution of Key Informant Interview Participants

| Industry | Number of Companies Listed in SEC Registry | Number of Companies Invited | Number of Companies Who Participated |
|---|---|---|---|
| ***Manufacturing*** | 526 | 135 | 1 |
| ***Wholesale and Retail Trade*** | 4040 | 88 | 1 |
| ***Transportation and Storage*** | 373 | 65 | 0 |
| ***Accommodation and Food Service*** | 1523 | 221 | 1 |
| ***Financial and Insurance Activities*** | 607 | 110 | 1 |
| ***Administrative and Support*** | 827 | 33 | 1 |
| ***Education*** | 357 | 192 | 4 |
| ***Total*** | **8253** | **844** | **9** |

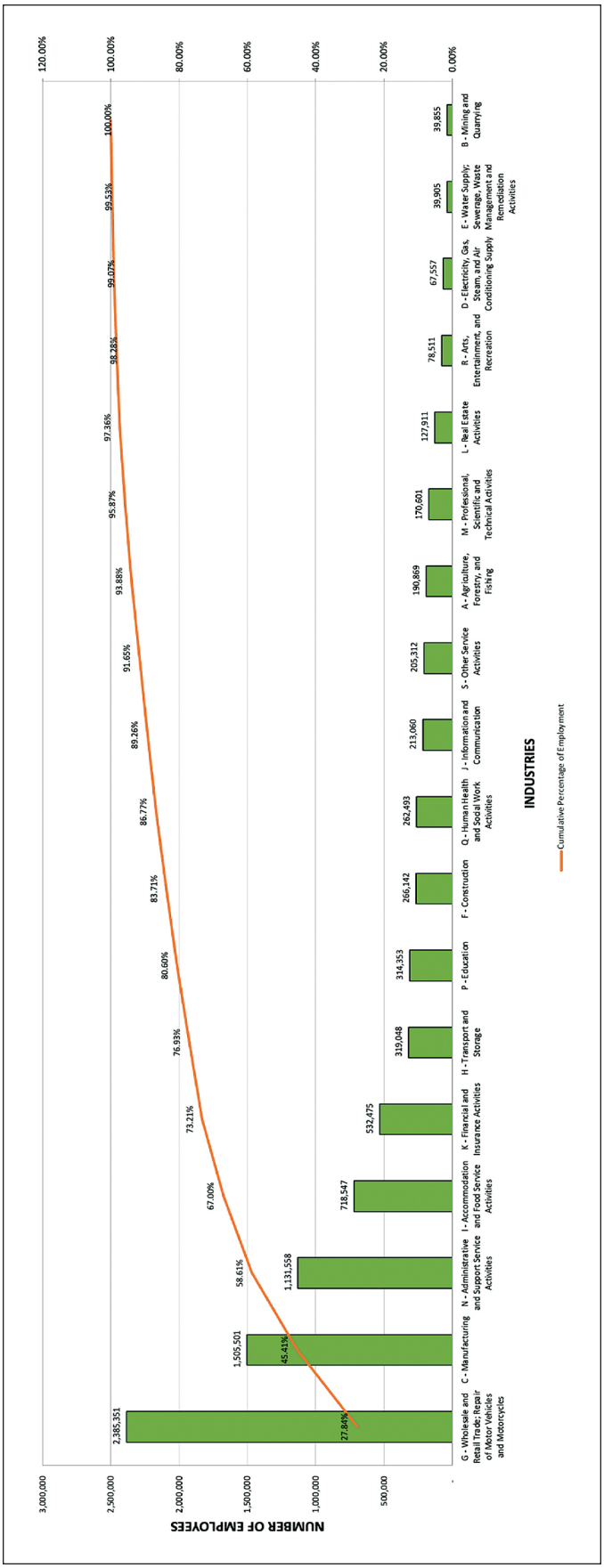


**Figure 2.** Pareto chart of the Number of Employment of Establishments in Operation by Industry Section - Philippines 2021.[3]

**Table 2.** List of Medical Societies and Government Agencies that were Invited in the Expert Consensus-building Process

| Medical Societies | Government Agencies |
|---|---|
| • Philippine College of Occupational Medicine<br>• Philippine Academy of Family Physicians<br>• Philippine College of Radiology<br>• Philippine Society of Otolaryngology - Head and Neck Surgery<br>• Philippine Society of Sleep Medicine<br>• Philippine Dermatological Society<br>• Philippine Society for Microbiology and Infectious Diseases<br>• Philippine College of Physicians<br>• Philippine Society of Nephrology<br>• Philippine College of Chest Physicians<br>• Philippine Academy of Ophthalmology<br>• Philippine Orthopedic Association<br>• Philippine Academy of Rehabilitation Medicine<br>• Philippine Psychiatry Association<br>• Philippine College of Addiction Medicine<br>• Philippine College of Surgeons | • Department of Labor and Employment - Bureau of Working Conditions<br>• Department of Labor and Employment - Employees' Compensation Commission<br>• Department of Labor and Employment - Occupational Safety and Health Center<br>• Department of Health - Disease Prevention and Control Bureau<br>• Department of Health - Health Promotion Bureau<br>• Philippine Health Insurance Corporation<br>• Social Security System<br>• Government Service Insurance System |

**Table 3.** List of Medical Societies and Government Agencies that Participated in the Expert Consensus-building Process

| Participated | Number of Participants |
|---|---|
| ***Department of Labor and Employment - Bureau of Working Conditions*** | 1 |
| ***Department of Labor and Employment - Employees' Compensation Commission*** | 1 |
| ***Department of Health - Disease Prevention and Control Bureau*** | 2 |
| ***Philippine College of Occupational Medicine*** | 1 |
| ***Philippine Academy of Family Physicians*** | 1 |
| ***Philippine College of Radiology*** | 1 |
| ***Philippine Society of Otolaryngology - Head and Neck Surgery*** | 1 |
| ***Philippine Society of Sleep Medicine*** | 1 |
| ***Philippine Dermatological Society*** | 2 |
| ***Philippine Society for Microbiology and Infectious Diseases*** | 1 |
| ***Philippine Society of Nephrology*** | 1 |
| ***Philippine College of Chest Physicians*** | 1 |
| ***Total*** | 14 |

Broader themes such as health safety programs, training requirements, service delivery, health workforce, information systems, financing, and governance were also explored. Each interview lasted one to two hours. Written informed consent was obtained from all participants.

Drawing from the scoping review and key informant interviews, a consolidated list of industry-specific medical examinations and diagnostic tests was developed. Tests considered for deliberation were selected according to these criteria: (1) compliance with existing legal mandates, (2) alignment with the leading causes of morbidity and mortality in the Philippines, and (3) relevance to occupational injuries and diseases reported in the Integrated Survey of Labor and Employment (ISLE) conducted by the Philippine Statistics Authority (2015/2016, 2017/2018, and 2019/2020). The synthesized data were organized into a comprehensive report that included definitions and indications, which was then presented to an expert panel for review.

Expert panel members were invited through medical societies and government agencies with authority over the identified tests and occupational health policies (Table 2). Participants were purposively chosen for their direct involvement in policy development, occupational health regulation, and medical practice. Fourteen experts participated, representing a wide range of specialties as well as key agencies. The final number of panelists was determined by the willingness of invited societies and agencies to engage in the consensus-building process. A complete list of participating institutions is provided in Table 3.

To determine the appropriateness of a specific health procedure, a mixed methods consensus-building process was employed through the modified RAM. A procedure is considered appropriate when the expected health benefit exceeds the expected negative consequences, including cost-effectiveness. A total of three rating rounds were concluded. The first rating round was done by sending the rating forms, instructions for completion, and a review of related literature via email. The experts were given around two weeks to complete and return the forms for consolidation. The degree of agreement and the appropriateness of the tests and procedures were determined to categorize whether a test or procedure must be included or excluded in the basket of tests.[5] (Table 4) The second rating round was a structured meeting via Zoom led by a moderator. During the meeting, the panelists discussed the ratings, focused on areas of disagreement, and were allowed to modify the original list of indications and/or definitions if desired. After the meeting, the results of inconclusive tests were consulted with key specialists relative to the involved medical procedure. Including the inputs of the key specialists, the third and final rating round was held again online, and the list of tests was then finalized, collated, and analyzed. As such, deviations from the usual RAND include: (1) conducting the second rating round online instead of a face-to-face meeting, (2) conducting an asynchronous session for non-attendees of the synchronous online rating for round 2; this includes the video recording, the summary transcript of the proceedings, and an online rating form. Nonetheless, the study procedures followed the recommendations where tests and procedures that did not

**Table 4.** Definitions of Appropriateness and Degree of Agreement

| | Appropriateness | | Degree of Agreement |
|---|---|---|---|
| ***Appropriate*** | Panel median of 7-9 without disagreement | ***Agreement*** | Less than or equal to 4 panelists rate outside of the 3-point region |
| ***Uncertain*** | Panel median of 4-6 OR any median with disagreement | ***Disagreement*** | More than or equal to 5 panelists rating in each extreme (1-3 and 7-9) |
| ***Inappropriate*** | Panel median of 1-3, without disagreement | ***Indeterminate*** | Neither the conditions for agreement nor disagreement were met |

*Source: The RAND/UCLA Appropriateness Method: User's Manual*[5]

reach consensus were discussed further in a third rating round. Final recommendations were consolidated by the study team and validated with the panel prior to inclusion in the results.

### Data Analysis

Qualitative interview data were transcribed and analyzed thematically, with codes assigned inductively and organized around domains from the interview guide. Themes were synthesized and used to inform expert panel deliberations. The RAM process provided a structured analysis of panel ratings, ensuring that both consensus and variability were transparently reported. While no formal sensitivity analyses were conducted, the modified RAM process functioned as a robustness check by revisiting of items with inconclusive ratings after the initial round, getting input from relevant specialists, and re-rating for the third round. No imputation was applied, and analyses were carried out using available data only.

### Ethical Considerations

All participants gave informed consent before joining the study. Confidentiality of responses was maintained throughout, and procedures adhered to ethical standards for research involving human participants.

## RESULTS

### Scoping Review

The scoping review surfaced a wide range of guidelines at the local, national, and international levels concerning employment-related medical examinations (EMEs), particularly PEMEs and APEs. While frameworks such as Occupational Safety and Health (OSH) Law and various DOLE and DOH issuances provide direction, the actual scope and application of these examinations remain inconsistent. Some policies prescribe broad lists of laboratory and diagnostic tests, while others emphasize a risk-based approach anchored on occupational hazards. This inconsistency mirrors what is seen internationally, where older systems tend to rely on disease-oriented protocols, while more mature systems have shifted toward standardized, hazard-specific requirements that prioritize job relevance over routine checklists.

### Implementation Fidelity

Findings from the implementation fidelity analysis revealed that while PEMEs and APEs are being carried out across industries, their design and implementation often deviate from what is outlined in national guidelines. Differences were evident in test selection, frequency of examinations, and recordkeeping. Although the OSH Law stipulates that APEs should be employer-funded, reports highlighted cases where employees shouldered part of the costs. These situations arose when companies offered only limited packages, when workers requested additional tests outside the mandated minimum, or when faster results sought through private providers. The extent of fidelity also appeared to depend on the sector. Industries with stronger regulatory oversight and greater resources, such as manufacturing and food handling, showed higher compliance. In contrast, those with weaker systems and limited budgets displayed greater variability, with some relying on minimal package that met only the most basic requirements.

### Key Informant Interviews

There is a lack of specific guidance regarding the laboratory and diagnostics tests required for employment. As exemplified in the interview results, companies are left to decide on their own or rely on the health certification requirements of the local government unit (LGU) in determining the appropriate medical examination and employment-related diagnostic examinations relevant to their unique occupational conditions and hazard exposures. The latter poses another challenge as each LGU tends to have a different set of laboratory requirements, putting an emphasis on the importance of standardization. In some companies, laboratory requirements for employment are determined based on the personal preference of the employer, usually influenced by existing occupational health and safety regulations, labor laws, and protocols of more prominent companies within the same industry. Employer preference and compliance with the regulations mandated by the LGUs and by law drive the companies to avail of outsourced PEME and APE packages. These packages may vary depending on the clinic or hospital offering these PEME and APE services. Funding for these PEME and APE packages is obtained either from out-of-pocket expenditures of the employee or the employer, and costs incurred from the provision of these services

may influence the types of tests that will be availed. In one company, the APE is only made available to higher-ranking officials. In contrast, PEME packages are still made available to all employees to comply with the requirements set by the Department of Labor and Employment (DOLE). In another company, the PEME and APE are only recommended and not mandatory. Hence, complete coverage of all employees is not guaranteed.

## Recommendations of the Expert Panel

The recommendations consolidated from the process are summarized by the following salient features: 1) the medical examination and laboratory diagnostics are ultimately dependent on the occupational health physician and/or the OSH committee, 2) history taking (including occupational history) and physical examination are the cornerstones of the screening process, 3) the review of systems (ROS) is also an adjunct for determination of the need for further laboratory tests and diagnostics, 4) appropriate screening tests for asymptomatic pre-employment examination only includes chest X-ray and CBC, and 5) appropriate screening test for asymptomatic periodic examination, like the APE, only includes chest X-ray. As such, the following parts of the medical history, ROS, and PE were especially mentioned to be present in all pre-employment and periodic examinations (Table 5). The expert panel identified specific components of history taking and physical examination that should be emphasized. Across all industries, an occupational history was deemed essential to capture exposure-related risks. Screening for cardiovascular risk factors and hypertension was consistently recommended. Risk factors for diabetes mellitus were also prioritized given its high prevalence among the working population. History taking for symptoms of parasitic infections was recommended to avoid routine stool examinations, with relevance noted in food-related industries. Industry-specific additions were also identified. In the education industry, the assessment of immunity to childhood diseases, such as measles, mumps, rubella, and varicella, was recommended. In the accommodation and food service industry, a history of Hepatitis A immunization was emphasized. In the manufacturing and transport sectors, the use of the Mathias Criteria was highlighted to address occupational dermatitis.

On the other hand, the recommendations for additional pre-employment and periodic screening tests are mostly industry-based. The industry-specific pre-placement and periodic examination recommendations are organized in Table 6. Note that the initial number of laboratory tests deliberated was derived from the number of tests from the first round requiring a work-up in a diagnostic or specialty clinic.

For pre-employment examinations, consensus indicated that only a chest x-ray and complete blood count (CBC) are appropriate routine screening tests in otherwise healthy, asymptomatic individuals. For periodic (annual) examinations, the panel agreed that only the chest x-ray should be routinely included, with other tests to be added only when justified by specific occupational exposures or clinical

**Table 5.** Expert Panel Recommendations on the Components of the Medical Examination to Highlight from the Medical History, ROS, and PE

| Component | Rationale |
|---|---|
| ***Occupational History*** *(for all industries)* | • Additional medical tests and examinations for medical surveillance should be risk-based according to occupation |
| ***History of nerve injury, pathology, or mechanical compromise*** *(for all industries)* | • May easily be incorporated into the medical history and may provide insight on the risk for WMSDs without having to perform provocation tests/maneuvers |
| ***Risk factors for CVD and HPN*** *(for all industries)* | • Cardiovascular diseases (CVDs) remain to be one of the top causes of morbidity and mortality in the country<br>• Provides baseline data on additional tests that may be conducted for further assessment |
| ***Risk factors for Diabetes Mellitus*** *(for all industries)* | • Diabetes mellitus part of top causes of morbidity and mortality in the country |
| ***Symptoms of parasitism*** *(for all industries)* | • Prevents unnecessary testing for parasitic infections such as the stool examination, commonly ordered as part of the pre-employment examination<br>• Recommended as part of the history-taking for all industries, especially for the food industry, to facilitate early detection and prevention of spread |
| ***Clinical history to screen for immunity for childhood diseases like Mumps, Measles, Rubella, Varicella for pre-employment*** *(for Education Industry)* | • Provides baseline data for pre-employment<br>• As a preventive measure, it may provide guidance on which vaccinations must be ordered to prevent contracting the disease (especially the communicable diseases) in the workplace<br>• Particularly important for the Education Industry, especially those with high risk of exposure to common infectious childhood diseases (e.g., preschool teachers, daycare center employees) |
| ***History of immunization against Hepatitis A*** *(for Accommodation and Food Industry)* | • The hepatitis A titer is the IgG anti-HAV which will indicate immunity against hepatitis A; or a certificate of immunization against hepatitis A can be submitted in place of the blood test. |
| ***Screening for Occupational Dermatitis – Mathias Criteria*** *(for Manufacturing and Transport/Storage Industries)* | • Occupational Dermatitis is one of top occupational diseases |

indications. These recommendations highlight a shift away from broad, non-evidence-based test packages toward a streamlined, risk-based approach that minimizes unnecessary procedures and costs while retaining diagnostic value.

## DISCUSSION

Rule 1961.03 of the Occupational Safety and Health Standards (OSHS), as amended, requires all employers to conduct medical surveillance on their workers for early detection and management of occupational and work-related diseases to guarantee their safety and health.[7] Republic Act (RA) No. 11058, issued by the DOLE, reiterated the employers' responsibility and strengthened it by penalizing those violating the said provision of the Standards.[7] All workers are required by existing regulations to undergo medical examinations before and during employment at appropriate intervals. These are based on working conditions and hazards, such as whether the workers are being transferred to another area, returning to work from their recuperation, or having illnesses and separation from employment.

General trends apply such as the focus on current medical conditions, cardiac and diabetes risk factors, as well as screening for a history of nerve injury, signs of parasitism, and occupational dermatitis. Regarding laboratory tests, the types of tests included in these medical examinations must be based on the hazards and exposure risks of the employees relative to the industry to which the company belongs. However, there is no available local data on the hazards commonly present in each industry.[8] Because of the absence of this information, the study only included the medical exams and laboratories in relation to the national surveys on general and occupational diseases conducted by the PSA.

Noteworthy is that laboratory tests and diagnostics ultimately depend on the establishment's occupational health physician and/or the OSH committee. One recommendation is for the job-demands analysis to be available for the physician which can serve as a basis for requesting additional testing if deemed necessary.[2] This is consistent with the study of Adeko and Ariba that mentions that the job description should guide pre-employment examinations; many of the speculated benefits of the tests have insufficient scientific basis.[9] Another study suggested that indiscriminate screening will even lead to concerns about validity, discrimination, and unwanted administrative costs.[10] Building a diagnostic framework during medical examination using "standard" tests (urine testing, chest X-ray, fecalysis, etc.) is highly questionable.[11] The Philippine OSHS also stipulated that regular biochemical monitoring must be conducted if there is exposure to toxic substances/pesticides classified under

**Table 6.** Final Recommendations for Asymptomatic Pre-employment and Periodic Examination

| Industry | Final List of Medical Exams (including specific special parts of history, PE and ROS) | Final List of Diagnostic Laboratory Tests and Imaging** |
|---|---|---|
| **Pre-employment** | | |
| ***General*** | • Medical History Taking<br>◦ To include:<br>▪ Occupational History<br>▪ History of nerve injury, pathology, or mechanical compromise<br>▪ Risk factors for CVD and HPN<br>▪ Risk factors for Diabetes Mellitus<br>▪ Symptoms of parasitism<br>• Physical Exam | Chest X-ray (CXR)<br>Complete Blood Count (CBC) |
| **Periodic / Annual Examination** | | |
| ***Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles*** | • Medical History Taking<br>◦ To include:<br>▪ Occupational History<br>▪ History of nerve injury, pathology, or mechanical compromise<br>▪ Risk factors for CVD and HPN<br>▪ Risk factors for Diabetes Mellitus<br>▪ Symptoms of parasitism<br>• Physical Exam | CXR |
| ***Manufacturing*** | • Medical History Taking<br>◦ To include:<br>▪ Occupational history<br>▪ History of nerve injury, pathology or mechanical compromise<br>▪ Risk factors for CVD and HPN<br>▪ Risk factors for Diabetes Mellitus<br>▪ Symptoms of parasitism<br>▪ Mathias Criteria*<br>• Physical Exam<br>◦ To include: Mathias Criteria* | CXR |

**Table 6.** Final Recommendations for Asymptomatic Pre-employment and Periodic Examination *(continued)*

| Industry | Final List of Medical Exams (including specific special parts of history, PE and ROS) | Final List of Diagnostic Laboratory Tests and Imaging** |
|---|---|---|
| **Periodic / Annual Examination** | | |
| ***Administrative and Support*** | • Medical History Taking<br>◦ To include:<br>▪ Occupational history<br>▪ History of nerve injury, pathology or mechanical compromise<br>▪ Risk factors for CVD and HPN<br>▪ Risk factors for Diabetes Mellitus<br>▪ Symptoms of parasitism<br>• Physical Exam | CXR |
| ***Accommodation and Food Industry*** | • Medical History Taking<br>◦ To include:<br>▪ Occupational history<br>▪ History of nerve injury, pathology or mechanical compromise<br>▪ Risk factors for CVD and HPN<br>▪ Risk factors for Diabetes Mellitus<br>▪ Symptoms of parasitism<br>▪ History of immunization against Hepatitis A (HepA)<br>• Physical Exam | CXR |
| ***Financial and Insurance Activities*** | • Medical History Taking<br>◦ To include:<br>▪ Occupational history<br>▪ History of nerve injury, pathology or mechanical compromise<br>▪ Risk factors for CVD and HPN<br>▪ Risk factors for Diabetes Mellitus<br>▪ Symptoms of parasitism<br>• Physical Exam | CXR |
| ***Transport and Storage*** | • Medical History Taking<br>◦ To include:<br>▪ Occupational history<br>▪ History of nerve injury, pathology or mechanical compromise<br>▪ Risk factors for CVD and HPN<br>▪ Risk factors for Diabetes Mellitus<br>▪ Symptoms of parasitism<br>▪ Mathias Criteria*<br>• Physical Exam<br>◦ To include: Mathias Criteria* | CXR |
| ***Education*** | • Medical History Taking<br>◦ To include:<br>▪ Occupational history<br>▪ History of nerve injury, pathology or mechanical compromise<br>▪ Risk factors for CVD and HPN<br>▪ Risk factors for Diabetes Mellitus<br>▪ Symptoms of parasitism<br>▪ Clinical history to screen for immunity for childhood diseases like Mumps, Measles, Rubella, Varicella for pre-employment<br>• Physical Exam | CXR |

* *Mathias criteria include both medical history taking and physical exam: (1) clinical appearance consistent with contact dermatitis, (2) workplace exposures to potential irritants or allergens, (3) anatomic distribution of dermatitis consistent with cutaneous exposure in relation to the job task, (4) temporal relationship between exposure and onset consistent with contact dermatitis, (5) nonoccupational exposures excluded as probable causes, (6) improvement of condition if away from work exposure, and (7) patch or prick tests implicate a specific workplace exposure*[6]

** *Additional tests for medical surveillance by the industry-based occupational health physician and/or the Occupational Safety and Health (OSH) committee should be based on job demands and specific exposure*

toxicity categories I and II of the World Health Organization (WHO).[7] For specific chemical exposures, the Occupational Safety and Health Administration (OSHA) has a very rich collection of medical screening and surveillance requirements per specific chemical.

The consensus panel reaffirmed the importance of targeted medical history and physical examination, with emphasis on cardiovascular and diabetes risk factors, parasitic infections, and occupational dermatitis in the selected industries. Among the diagnostic tests, only chest radiography is mandatory for all employees, specifically for the pre-employment screening process. The inclusion of chest radiography across all industries is pursuant to OSHS, which states that pre-employment/placement examinations should include chest X-ray.[7] The same rule mentions including "special laboratory examinations when necessary due to the peculiar nature of the workers' prospective employment," but the specific special tests were not identified. Another basis for the chest X-ray includes the DOLE D.O. 73-05 (s.2005) or the "Guidelines for Implementation of Policy and Program on Tuberculosis (TB) Prevention and Control in the Workplace" pursuant to Executive Order No. 187 "Instituting a Comprehensive and Unified Policy for Tuberculosis Control in the Philippines."[12] The inclusion of a mandatory chest X-ray as part of the pre-employment and periodic medical examination of employees is part of the active case-finding strategy, where individuals with CXR findings suggestive of TB infection are regarded as Presumptive TB cases. This facilitates early detection and treatment of TB even before the employment process.

General pre-employment screening recommendations from the panel notably included a complete blood count (CBC) panel, aside from chest radiography across all industries. While the addition of blood tests is not mandatory as per the OSHS Manual, the panel highly recommended the inclusion of a baseline CBC to serve as a basis for further screening. Otherwise, those with deviations from the normal readings at baseline must be followed up accordingly should the employer decide to hire the applicant.

While additive recommendations were made during the rating rounds of the study, several exclusions were also noted. For example, diagnostics for Hepatitis B, HIV screening, and psychological tests were not recommended due to local occupational laws preventing unnecessary screening that may be subjected to discrimination against the employee. The consensus panel results also indicated that some widely used routine tests, such as urinalysis and stool examination, are not necessary as standard requirements for all workers. Their utility lies instead in specific contexts, particularly when used as biologic monitoring tools for defined workplace exposures. For instance, urinalysis can reveal renal effects of solvent or heavy metal exposure, and stool examinations, if with risk factors, continue to be relevant in the food service industry for detecting parasitic infections. This is further corroborated by cited studies, including the precedent, the Philippine Periodic Health Examination (PHEx) set regarding some of the unnecessary screening tests.[13] One example is the recommendation against the use of resting or exercise ECG to screen for coronary artery disease among asymptomatic and apparently healthy adults. The PHEx also mentioned that only "targeted screening for prediabetes and T2DM for people with risk factors is cost-effective," on top of the issue on the standardization certification of laboratories if using HBA1c. Another reason for excluding tests is if the condition can be screened effectively by history and PE, like screening for diabetes mellitus, cardiovascular diseases, UTI, parasitic infections. These usually practiced screening tests were not recommended due to the lack of substantial evidence on the benefits. The inclusion of Hepatitis A Screening was specifically recommended for the periodic examination of employees in the Accommodation and Food Industry due to the risk of transmission. It was mainly discussed that Hepatitis screening must be done for Hepatitis A, not Hepatitis B which is a commonly ordered screening test. The reason for the non-recommendation of Hepatitis B screening for pre-employment is pursuant to DOLE D.A. No. 5 (s. 2010).[14]

Locally, the Quezon City Council issued Ordinance No. SP-2502, s2016 which is the "Revised Sanitation Code of Quezon City."[15] It is noteworthy that this ordinance also includes fecalysis as a requirement to get a health certificate for all food and non-food handlers employed in Quezon City. Urinalysis was originally included in the 2005 Sanitation Code of Quezon City, but was removed in the latest revision of the ordinance.[15,16] This points out that each LGU can require additional laboratories that the occupational health physicians should be aware of as well.

## Scope and Limitations of the Study

This study focused on establishing expert consensus on appropriate medical and laboratory tests for pre-employment and periodic examinations in major industries in Quezon City. However, it is limited by the availability, accessibility, and completeness of data. To control the possible selection bias, we have invited a number of companies per identified industry (Table 1). However, we encountered scheduling conflicts and varying willingness of key informants and experts, which was mitigated through consistent follow-up. Missing responses were handled by complete case analysis without imputation, and non-participation was not systematically reported.

The scope was further constrained by the exclusion of labor groups and employees themselves, with key informants limited to private companies and experts drawn from medical societies and government agencies. Only the top 20% of industries in Quezon City were included, limiting generalizability. In addition, statistical treatment for confounding control, subgroup and sensitivity analyses, and cost-effectiveness evaluations were not performed, as these were beyond the study's scope as the main outcome will be determined by the expert panel themselves. Since the scoping review was conducted in 2022, some policies may have been

updated. These limitations highlight the need for future studies with broader sectoral engagement, updated policy alignment, and inclusion of multi-sectoral stakeholders to enhance credibility and representativeness.

## CONCLUSION

Currently, there is a shift in measures wherein occupational health and safety, particularly in the pre-employment and periodic screening practices, are implemented. Various factors such as employees' time, resources, and overall well-being, aside from cost-effectiveness, must be considered when conducting different laboratory and diagnostic tests. Preventing unnecessary and low-yield testing not only reduces costs for both employers and employees but also avoids undue burden on workers, although detailed cost-effectiveness analysis is beyond the scope of this study. It is, therefore, imperative that the medical history and physical examination must be the cornerstones for initial assessment. This helps provide adequate information about the applicant's and/or the employee's current health status and will guide the occupational health physician on which laboratory and diagnostic procedures to request for further assessment.

Clinical history taking, physical examination, and skill-dependent assessments must also be standardized for all occupational health physicians. This emphasizes the need to devise a screening questionnaire or checklist that highlights specific parts of the history and PE, such as the Mathias criteria for the assessment of occupational dermatitis, the maneuvers and tests for the assessment of WMSDs, etc. Skills training of occupational health physicians in the proper conduction of these medical assessments must also be done. As for the laboratory procedures, CXR and CBC were deemed appropriate during pre-employment examinations, while only CXR for periodic examinations. But as emphasized, additional tests will ultimately depend on the establishment's occupational health physician and the OSH Committee and should be based on the job demands, industry-specific risks, and specific exposure.

Future work should integrate results from implementation fidelity assessments and broaden participation by including labor groups, industry representatives, and workers themselves. This will strengthen the credibility, representativeness, and policy relevance of standardized guidelines for employment-related medical examinations.

### Acknowledgments

The authors would like to express their gratitude to Dr. Cenon Alfonso (ASMPH Dean) and Dr. Lourdes Tanchanco (ACRI Director) for their unwavering support, the Philippine Statistics Authority (PSA) for providing us with the data in making our analysis, and to the Philippine College of Occupational Medicine (PCOM) Quezon City Chapter for collaborating with us in this project. The authors would also like to thank Dr. Jehremias Florante from the Occupational Safety and Health Center (OSHC-DOLE) and Dr. Roberto Putong (Social Security System) for their technical assistance in this study.

Most importantly, the project will not be possible without the expert panel: Dr. Felix Labanda, Jr. (DOLE Bureau of Working Conditions), Dr. Christine Marquez (DOLE Employees' Compensation Commission), Dr. Ruth Divine Agustin (DOH Disease Prevention and Control Bureau), Dr. Jan Derek Junio (DOH Disease Prevention and Control Bureau), Dr. Anna Sofia Fajardo (Philippine College of Occupational Medicine), Dr. Karin Estepa-Garcia (Philippine Academy of Family Physicians), Dr. Imarzen Elepaño (Philippine College of Radiology), Dr. Eduard M. Alfanta (Philippine Society of Otolaryngology - Head and Neck Surgery), Dr. Evelyn Pingul-Agno (Philippine Society of Sleep Medicine), Dr. Lillian Villafuerte (Philippine Dermatological Society), Dr. Margaret Jimenez (Philippine Dermatological Society), Dr. Maria Fe Tayzon (Philippine Society for Microbiology and Infectious Diseases), Dr. Rommel Bataclan (Philippine Society of Nephrology), and Dr. Julio Benedicto (Philippine College of Chest Physicians). Other reference specialists include Dr. Marie Giselle Franco (Ophthalmology), Dr. Mark Sta. Maria (Neurology), and Dr. Paulette Nacpil-Dominguez (Endocrinology).

### Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

### Author Disclosure

All authors declared no conflicts of interest.

### Funding Source

This study was funded by the Ateneo de Manila University (AdMU) University Research Council.

## REFERENCES

1. International Labour Office. Technical and ethical guidelines for workers' health surveillance (Occupational Safety and Health Series No. 72). Geneva: International Labour Office; 1998.
2. Pachman J. Evidence base for pre-employment medical screening. Bull World Health Organ. 2009 Jul;87(7):529-34. doi: 10.2471/blt.08.052605. PMID: 19649367; PMCID: PMC2704034.
3. Philippine Statistics Authority. 2021 Annual Survey of Philippine Business and Industry (ASPBI) - All Establishments by Employment Grouping [Internet]. 2021 [cited 2023 Oct 22]. Available from: https://www.psa.gov.ph/content/2021-annual-survey-philippine-business-and-industry-aspbi-all-establishments-employment.
4. Harel Z, Silver SA, McQuillan RF, Weizman AV, Thomas A, Chertow GM, et al. How to diagnose solutions to a quality of care problem. Clin J Am Soc Nephrol. 2016 May 6;11(5):901-7. doi: 10.2215/CJN.11481015. PMID: 27016495; PMCID: PMC4858489.
5. Fitch K, Bernstein SJ, Aguilar MD, Burnand B, LaCalle JR, Lázaro P, et al. The RAND/UCLA appropriateness method user's manual [Internet]. Santa Monica, CA: RAND Corporation. 2011 [cited 2023 Oct 22]. Available from: https://www.rand.org/content/dam/rand/pubs/monograph_reports/2011/MR1269.pdf.

6. Gómez de Carvallo M, Calvo B, Benach J, Pujol R, Giménez-Arnau AM. Evaluación de los criterios de imputabilidad de dermatosis profesional definidos por Mathias [Assessment of the Mathias criteria for establishing occupational causation of contact dermatitis]. Actas Dermosifiliogr. 2012;103(5):411-21. doi: 10.1016/j.ad.2011.12.007.
7. Occupational Safety and Health Center, Department of Labor and Employment. Occupational safety and health standards as amended. Intramuros, Manila: Occupational Safety and Health Center, Department of Labor and Employment; 2016.
8. Lu JL. State and trends of occupational health and safety in the Philippines. Acta Med Philipp. 2022;56(1):59–72. doi: 10.47895/amp.v56i1.3865.
9. Adeko OO, Ariba AJ. Pre-employment medical examination: an update. Niger J Fam Pract. 2016;7(1).
10. Ravichandran S, Phelan KV, Kirby K, Singh S, Ghosh A. Pre-employment testing practices in the hospitality industry in the U.S. and Australia. J Hum Resour Hosp Tour. 2022;21(4):524-47. doi: 10.1080/15332845.2022.2106614.
11. Sluiter JK. The new why when designing mandatory medical examinations. Occup Med (Lond). 2017;67(5):325–7. doi: 10.1093/occmed/kqx044.
12. Department of Labor and Employment. Department Order No. 73-05: Guidelines for the implementation of policy and program on Tuberculosis (TB) prevention and control in the workplace [Internet]. 2005 [cited 2023 Oct 22]. Available from: https://oshc.dole.gov.ph/wp-content/uploads/2021/05/Department-Order-No.-73-Series-of-2005.pdf.
13. Task Force on Philippine Guidelines on Periodic Health Examination. PHEX: Philippine Guidelines on Periodic Health Examination [Internet]. [cited 2025 Aug 23]. Available from: https://phex.ph/
14. Department of Labor and Employment. Department Advisory No. 05: Guidelines for the implementation of a workplace policy and program on Hepatitis B [Internet]. 2005 [cited 2023 Oct 22]. Available from: https://oshc.dole.gov.ph/wp-content/uploads/2021/05/Labor-Advisory-No.05-10-%E2%80%93-Guidelines-for-the-Implementation-of-a-Workplace-Policy-and-Program-on-Hepatitis-B.pdf.
15. Quezon City Government. Ordinance No. SP-2502, s2016: An ordinance revising SP-1735, S-2006, otherwise known as the "Sanitation Code of Quezon City." 2016.
16. Quezon City Government. Ordinance No. SP-1735, s2006: An ordinance prescribing the Sanitation Code of Quezon City pursuant to the Local Government Code of 1991 and other pertinent laws. 2006.