


2021 ACADEMIC STAFF PROFILE FOR:

Dr. Isaac Kasilu Makau

1.1 Personal Profile

1.1.1 Personal Details

<p>Name: Dr. Isaac Kasilu Makau Title/Qualification: PhD (Occupational Safety and Health) M. Sc (Occupational Safety and Health) B.Sc (Industrial Chemistry) Second Class Upper Division Department: Environmental and Occupational Health Designation/Position: Lecturer Email: makau.isaac@ku.ac.ke or makauisaac2015@gmail.com Contact Address: Kenyatta University, P.O Box 43844-00100 Area of Specialization: - Occupational Safety and Health Research Interests: - Work Related Stress - Occupational Epidemiology - Work at Height</p>	
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1.1.2 Academic & Professional Qualifications

- PhD (Occupational Safety and Health), K.U. December, 2016
- M. Sc. (Occupational Safety and Health), JKUAT July, 2011
- B.Sc. (Industrial Chemistry), K.U. Second Class Honors, Upper Division
- Kenya Certificate of Secondary Education (KCSE), St. Charles Lwanga School, Kitui County, 1987-1990
- Kenya Certificate of Primary Education (KCPE), Syomunyu Primary School – 1979 – 1986

1.1.3 Employment History

- Lecturer, Kenyatta University, Environmental and Occupational Health Department, from September, 2017 to date.
- Tutorial Fellow, Kenyatta University, Environmental and Occupational Health Department, from September, 2012 – 2016.
- 2010-2011; Continuous Improvement Management Services (CIMS) Ltd; Conducted consultancy work on establishment, implementation and documentation of BS OHSAS 18001: 2007 i.e. an Occupational Health and Safety Management System.
- 2008-2009; ALARP Safety and Environment Consultants; Lead Consultant in the provision of advisory services to organizations regarding the Occupational Safety, Health and Environment industry “best practice”. The main tasks in this case were to conduct extensive review of existing policies and programs on the current status of Occupational Safety, Health and Environment in the workplaces
- The table below shows some statutory safety and health advisory services that I have rendered to organizations listed below:

Agency/Organization/Client	Assignment Name	Year (s)	Designation	Responsibilities
Mwalimu National Savings and Credit Co-Operative Society Limited	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments • Safety and health committee training 	March 2020	Safety and health adviser/Auditor	To establish the level of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations and finally train the members of safety and health committee
IBM Research Africa, Nairobi County, Kenya Cueva, Karen Campus, Langata Road, Nairobi County, Kenya	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments 	July 2019	Safety and health adviser/Auditor	To establish the levels of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations

Oxfam Kenya. The Atrium, Chaka Road, Kilimani, Nairobi, Kenya P.O. box 40680, 00100 (GPO) Nairobi	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments 	March, 2018	Safety and health adviser/Auditor	To establish the levels of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations
De La Rue Currency and Security Print (K) Ltd, Noordin Road, Off Thika , Nairobi, Kenya P.O. Box 38622 - 00623, Nairobi, Kenya	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments • Fire Safety Audit 	July, 2018	Safety and health adviser/Auditor	To establish the levels of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations
Teledata Technologies Ltd, Mombasa Road, Industrial Area- Nairobi, P.O Box 40826- 00100 Nairobi Kenya.	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments • Fire Safety Audit 	January, 2017	Safety and health adviser/Auditor	To establish the levels of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations
Delta Energy Systems (K) Ltd Mombasa Road, Industrial Area- Nairobi, P.O Box 26765- 00100 Nairobi Kenya	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments • Fire Safety Audit 	May, 2017	Safety and health adviser/Auditor	To establish the levels of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations

1.1.4 Achievements

- **Approved Safety and Health Adviser (Certificate OSH/ADV 075)**; Ministry of Labour and Social Protection; Directorate of Occupational Safety and Health Services; Approval Certificate No. OSH/ADV 075)
- National Environment Management Authority (NEMA) registered as an **Environmental Impact Assessment Expert** in accordance with the provisions of Environmental Management and Coordination Act (EMCA, 1999) to practice in the capacity of a **lead expert (Certificate No. 2288)**
- Ministry of Labour and Social Protection; State Department for Manpower Planning; **Member of the task team** for the revision of **Kenya National Occupational Classification Standard (KNOCS-2000)**
- **KEBS/STA/16/16**; Member of the Occupational Safety and Health Technical Committee (KEBS TC 144 SC2 – OSH Technical Committee) from 5th August,2016

1.2 Publications

Risk Factors Associated with Artisanal and Small-scale Gold Mining in Rosterman, Kakamega, Kenya

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Abstract Occupational injuries, though preventable, have been described as a major public health problem. In artisanal and small-scale gold mining (ASGM), little is known about the risk factors to injuries. In 2018, we examined injuries and the potential risk factors among ASGM workers in Rosterman, Kakamega County, Kenya. A descriptive cross-sectional survey was conducted and three hundred and thirteen (313) ASGM workers were interviewed regarding their occupational injuries experiences over the preceding 1 year. Data was collected using structured interviewer administered questionnaires with the aid of open data kit (ODK) platform. Injury rates were estimated at 44.7 injuries per 100 person years. The most affected body parts were hands, upper and lower limbs at 62.14%, 30% respectively. The risk factors associated with injuries included; having an alternative source of income($p=0.027$), an individual personal safety culture ($p=0.021$) and use of hammer or mallet as tools($p=0.022$). In conclusion, injuries are prevalent among ASGM workers with several body parts being affected, the upper limbs being the most commonly affected. The study also demonstrated that there are various risk factors associated with injuries in ASGM. In view of those findings, the study recommends that injury prevention should be made a priority in ASGM intervention programs in order to reduce the burden of occupational injuries and also sensitize the workers on the risk factors they are exposed to.

Keywords Artisanal small-scale gold mining, ASGM, ASM, occupational injuries, mining, occupational health and safety, Rosterman, Kakamega

1. Introduction

With an increasing demand for minerals and precious metals in growing economies, artisanal and small-scale mining(ASM) has proliferated worldwide, practiced in about 50 countries [1]. Close to 100 million people are dependent on it for their livelihood and in rural Africa it supports several hundred thousand households [1,2]. In Kenya, it is estimated that approximately 140,000 people are engaged in ASM and about 800,000 people depend on it for their livelihood [3]. In 2013, it was estimated that Kenya's gold production was 3.6 tonnes with most of it originating from the artisanal and small-scale gold mining (ASGM) sector. In Rosterman, ASGM begun post 1952 after the colonial British mining company stopped their operations. The community in the area have since been mining the tailings of the abandoned sites as a source of livelihood [4]. The type of mining in Rosterman is both alluvial and hard rock mining [4]. The process of alluvial ASGM begins with digging ore from some sections of River Isiukhu where it is slow moving. The excavated ore is then processed through panning or sluicing. Hard rock mining on the other hand involves going underground through vertical or inclined narrow shafts in order to access the ore body. Using various tools such as picks, mallets, mattocks, chisels, hammers, shovels, the miners loosen the ore, excavate it, transport it through the shaft in sacks or

buckets for further mechanical processing [4,5]. The ore is then grounded using hand held mortar and pestle, in some cases by mallet into smaller pieces or by generator powered grinding machines. The fine powder is then sifted over a piece of cloth while the big pieces are re-ground and re-sifted.

Despite ASGM being a common economic activity, its casual nature of operations has often led to neglecting good occupational health and safety practices thus making it a source of accidents that result in injuries [6]. Other than the casual nature of operations, workers engaging in ASGM have been reported to be lacking in skills, training, knowledge and with limited resources to enable them to practice the trade safely [5,7]. Though not widely documented, the physical conditions, accompanied processes, and activities in ASGM are hazardous and are a concern for work-related injuries [5]. Some of the conditions that have led to injuries in ASGM include being struck by an object, falling, machinery and tools [5].

The International Labour Organization (ILO), estimated that non-fatal accidents are 6 to 7 times more common in small scale informal mines than in large scale organized mines [8]. In Kenya, ASGM has had a long standing illegal status up until 2016 when the repealed Mining Act CAP 306 of Kenyan laws that were in use since 1940 during the colonial period was replaced with the Mining Act no. 12 of 2016. In this new piece of legislation, ASGM is recognized and in section 98 sub-sections 2 and 3 there is a

1.2.1 Referred Journals

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1.2.2 Books and Books Chapters

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1.2.3 Conference/Workshops/Seminar Papers

- Attended a **FOUR (4) day workshop** at Paradise Inn Resort, Mombasa County, Kenya. It was organized by the Ministry of Labor and Social Protection; State Department for Manpower Planning. It was attended by all members of the task team (am the Kenyatta University nominee to the task team) for the revision of Kenya National Occupational Classification Standard (KNOCS-2000). The workshop was held from 8th – 11th December, 2020 at Paradise Inn Resort, Mombasa County, Kenya
- KEBS/STA/16/16; Kenyatta University nominee (member) to the Occupational Safety and Health Technical Committee (KEBS TC 144 SC2 – OSH Technical Committee) from 5th August, 2016. We have been meeting on quarterly basis to develop occupational safety and health standards for the Kenya Bureau of Standards (KEBS).

1.2.3.1 Conference Papers

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1.2.3.2 Workshops Papers

**MINISTRY OF LABOUR AND SOCIAL PROTECTION, STATE DEPARTMENT FOR
MANPOWER PLANNING**
(THE WORKSHOP WAS HELD AT PARADISE INN RESORT, MOMBASA COUNTY,
KENYA)

DURING THE WORKSHOP, I PRESENTED A PAPER ON THE REVISION OF THE
KENYA NATIONAL OCCUPATIONAL CLASSIFICATION STANDARD (KNOCS 2000)

S/No	Job Title	Job Description (Major Tasks Performed)	Minimum Entry Requirements
1	Occupational Safety and Health Professionals Existing job titles ➤ Occupational safety and health consultants ➤ Occupational safety and health advisors ➤ Occupational safety and health specialists ➤ Trainers in Occupational Safety and Health	<ul style="list-style-type: none"> ➤ Carry out regular workplace inspections ➤ Undertake safety and health risk assessments ➤ Conduct job safety analysis ➤ Incidence/accident/near miss investigations ➤ Prepare health and safety policies and programs/strategies ➤ Ensure safety and health policies and procedures are being properly implemented. ➤ Conduct internal safety and health audits ➤ Recommend changes to protect workers, and educate employees on how to prevent health problems through the use of safety training programs. ➤ Ensure compliance with safety and health legislation (OSHA, 2007 as well as the relevant subsidiary legislations). 	a) A Diploma/Postgraduate Diploma in Occupational Safety and Health from a recognized training institution <p style="text-align: center;">AND</p> b) Basic Computer skills;
2	Fire Safety Professions Existing job titles ➤ Fire marshals ➤ Fire wardens ➤ Fire safety auditors ➤ Fire safety officers ➤	<ul style="list-style-type: none"> ➤ Check compliance with the factories and other places of work (Fire Risk Reduction) Rules, 2007 ➤ Assessment of fire risks involving hazardous substances i.e., receipt, storage & handling. ➤ Review of safety awareness, fire drills and fire safety training requirements. ➤ Recommend fire protective measures e.g., fire detection/fire suppression, fire-resisting walls and floors. 	A minimum of O-Level Certificate, a Diploma in Fire Engineering (from a recognized Institution)

3	<p>Safety Engineers Existing Job Titles</p> <ul style="list-style-type: none"> ➤ Plant engineers ➤ Process engineers 	<ul style="list-style-type: none"> ➤ Develops policies to ensure safety of an environment, its customers and employees. ➤ Inspect equipment, environments and buildings to identify areas that can potentially cause health and safety hazards. 	<ul style="list-style-type: none"> ➤ Bachelor's Degree in Industrial Engineering, Systems Engineering and mechanical Engineering from a recognized institution
4	<p>Workplace Air Quality Monitors</p>	<ul style="list-style-type: none"> ➤ <i>Monitoring</i> the workplace environment ➤ These include direct reading detection tubes or detectors for gases and vapours, particulate matter sampler (an instrument for measuring the properties of particulates in the ambient air) or sampling pumps, heat stress meters, light meters, temperature and humidity detectors 	<ul style="list-style-type: none"> ➤ A degree in Science from a recognized institution
5	<p>Human Health Research Scientists Existing Job Titles</p> <ul style="list-style-type: none"> ➤ Research Officers ➤ Laboratory Research Officers ➤ Clinical Research Officers ➤ Data Analysts ➤ Research Administrator 	<p>In consultation with immediate supervisor, to manage institute and research resources</p> <p>Determine research activities aligned to set targets.</p> <p>Coordinate research activities & the implementation of research projects and/or supervising designated aspects of the work</p>	<p>University Degree in a relevant field from a recognized Institution</p>

	<ul style="list-style-type: none"> ➤ Nursing Research Officers ➤ Public health research officers ➤ Pharmaceutical Technologists/ Technicians ➤ Health Records and Information Technologists ➤ Biosafety and biosecurity officers ➤ Animal Health officers ➤ Grants management officers ➤ Quality and Risk Management Officers ➤ Monitoring and Evaluation Officers 	<p>Determine indicators for monitoring and evaluation of research activities</p> <p>Manage staff in various research units and coordinate field and laboratory activities</p> <p>Supervise research team members, laboratory technologists, technicians and or students/ interns in carrying out fieldwork and or laboratory experimental procedures</p> <p>Participate in research dissemination forums</p> <p>Participate in proposal writing and manuscript preparation under a supervisors</p> <p>Participate in proposal and manuscript reviews at various level</p>	
6	Director General	<p>Institution accounting officer and answerable to the Board</p> <p>Oversee all Institute's research processes from conceptualization up to policy</p> <p>Coordinate national and regional disease surveillance and emergency response in liaison with the Ministry of Health</p>	<p>Be a holder of an earned Doctor of Philosophy degree in any of the following fields:- Biomedical Sciences, Public Health, Medicine/Surgery/Pharmacy/Community Health, Epidemiology or any relevant Social Sciences or an equivalent qualification from a recognized institution</p>

		<p>Set up effective operational policies, procedures, budgets, internal controls and systems for identifying, measuring, monitoring and controlling institutional operations to drive the implementation of the approved strategy</p> <p>Lead in identifying funding for research and development through government, international, regional and local partner engagement</p> <p>Oversee contract negotiations and ensure development and implementation of KEMRI copyright and related policies, contractual documents</p> <p>Ensure that the Institute is adequately resourced to facilitate the effective and efficient management of the Institute</p> <p>Oversee harnessing of Institute's scientific knowledge and ensure intellectual rights are protected for potential commercialization</p> <p>Ensure the prudential management of the Institute's assets and financial resources within budget guidelines and according to existing laws and regulations</p> <p>Maintain a conducive work environment for attracting, retaining, and motivating employees</p>	
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		Ensures compliance with Public Financial Management Act and other related Acts like PPO Act	
7	Intellectual property officer	<p>Serve as primary point of contact for all IP related questions regarding IP and Digital Health in the Institute</p> <p>Develop, review and maintain the Institutional IP strategy for research and Digital Health</p> <p>Enhance awareness and knowledge about IP and Digital Health matters in the Institute</p> <p>Enhance stakeholder awareness about IP and Digital Health matters, including fostering basic knowledge</p> <p>Participate in or support due diligences regarding research IPs and Digital Health tools</p> <p>Support drafting of IP clauses in contracts concerning research and Digital Health</p> <p>Liaison with the legal dept throughout the Institute to advise on IP issues</p> <p>Provide basic awareness of global data protection and privacy issues as relevant to IP</p>	University degree in Intellectual property, Law or its equivalent

8	Graphic Designer	<p>Bring medical research communication alive through designs to ensure that they get the institute's messages come across with high visual impact.</p> <p>Ensure publishing of layout and design Information, Education and Communication (IEC) materials including print and electronic materials such as, logos, newsletters, e-newsletters, banners, brochures annual reports etc.</p> <p>Develop and maintain the corporate identification manual through standardization of communication and branding</p> <p>Proofread publications by revising artwork to produce accurate and high-quality design work to ensure consistency in the image and branding of the institute</p> <p>Create visual concepts, using computer software to communicate ideas that inspire, inform, or captivate the institute's publics</p> <p>Edit photographs by the use of software like Photoshop to enhance image quality or manipulate the picture for various use</p> <p>Manage design projects through multiple revisions while keeping keen attention to detail to effectively communicate the intended message</p>	Bachelor degree in graphic communication and advertising or any other related course
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		<p>Liaise with printing technicians by monitoring and revising of the art work</p> <p>Contribute in the management of the KEMRI's social media platforms through regularly updating for effective communication and increase positive visibility of the Institute</p> <p>Ensure that the Institute's image and brand are up-to-date with emerging technologies in new media, particularly design programs</p> <p>Develop graphics and layouts for product illustrations, company logos, and Internet websites to increase visibility</p> <p>Review final layouts and suggest improvements as needed to ensure quality production of materials</p> <p>Produce still and animated graphics for on-air and taped portions of television news broadcasts, using electronic video equipment to promote the institute's positive image.</p>	
9	Nursing Education Services (NES)	Responsible for the day to day operations of the Nursing Education Services (NES) office, and the professional development of Nursing Staff	Bachelor of Science Degree in Nursing (B.Sc. in Nursing)

10	Clinical Practice Educator (CPE)	The Clinical Nurse Educator (CPE) is responsible for delivery of safe and quality patient care through evidence based clinical practice and nurses' professional growth and development	Bachelor of Science Degree in Nursing
11	Lactation/Lamaz e educator	To provide lactation management services to expectant and new parents. Also provides child birth education classes to expectant families in accordance with the hospital's, policies, procedures and standards	Diploma in Nursing from a recognized institution
12	Unit Coordinator	To provide reception services for the unit, which includes communicating messages to supervisors/physicians, other staff of unit, and clerical functions involved in delivery of patient care, including maintenance of supplies and equipment as per established unit policies and protocols. Monitors attendance and leave record for the Unit Staff and assists in developing duty roaster as assigned by Unit Manager.	College graduate with diploma in Management/customer service
13	Cardiac Perfusionist	Works under the direction of Cardiac surgeon and anesthetist, to provide short term cardiopulmonary support during open heart procedures, long term support via ECMO or centrifugal ventricular pumps on cardiac or pulmonary compromised patients. Cardioplegia administration, hemo concentration, hemofiltration, and modified ultra-filtration on	Certificates in : <ul style="list-style-type: none"> • Cardiopulmonary resuscitation • Intra-aortic balloon pump • Biomedicus pump • Auto transfusion

		adult and pediatric patient	
14	Pathology – Haematology/ Chemistry/ Histopathology/ Microbiology	Ensure provision of effective, efficient, quality laboratory analytical services in the Hospital	Higher Diploma in Medical Laboratory Technology from a recognized institute
15	Clinical Pharmacist	Provide <i>quality and efficient</i> specialized pharmaceutical services to improve drug usage and therapeutic outcomes including, but not limited to, advising physicians on issues concerning drug therapy <i>that meets</i> or exceeds the expectation of the patient and <i>their relatives</i>	Post graduate diploma in Clinical Pharmacy Bachelor of Science Degree in Pharmacy
16	Clinical Officer	<ul style="list-style-type: none"> ➤ History taking, examining, diagnosing, educating and treating patients' common ailments at an outpatient or inpatient; ➤ Implementing Community Health Care activities in liaison with other health workers; ➤ Sensitizing patients and clients on preventive and promotive health; and ➤ Carrying out minor surgical procedures as per training and skill. 	Diploma in any of the following disciplines; Clinical Medicine & Surgery, Clinical Medicine & Community Health or its equivalent qualification from a recognized institution.
17	Dental Technologist	<ul style="list-style-type: none"> ➤ Assessing patients' needs; ➤ Verifying and maintaining information relating to patients; ➤ Pouring plastic and stone models of dental prosthetics. ➤ Repairing and/or 	Diploma in Dental Technology or its equivalent qualification from a recognized institution.

		<p>relining existing full and/or partial dentures.</p> <ul style="list-style-type: none"> ➤ Arranging and clasping teeth for new wire or cast chrome partials. ➤ Assisting in banding wire for clasping and making soldered rests for partial dentures. ➤ Assisting in the construction of new dental appliances by selecting and setting up acrylic or porcelain teeth using dental wax, articulator, and various waxing instruments according to dentist's prescription; ➤ Recording bite relations on dental articulators; and ➤ Assisting in grinding, smoothing, and polishing dental prosthetics using finishing burs and grinding equipment. 	
18	Orthopaedic and Trauma Technician	<ul style="list-style-type: none"> ➤ Manipulating and reducing fractures and dislocations; ➤ Fixing and applying pre-operative braces, clutches and other soft goods; ➤ Removing casts, sutures and splints; ➤ Assisting in preparing and applying casts and orthopaedic appliances; and ➤ Assisting with orthopaedic procedures including wound care and fracture reduction. 	<p>Certificate in Orthopaedic Plaster and Traction Technology</p> <p style="text-align: center;">OR</p> <p>Orthopaedic Plaster Technology from a recognized institution</p>
19	Orthopaedic Technologist (Orthopaedic Trauma	<ul style="list-style-type: none"> ➤ Documenting of patients history and diagnosis; 	<p>Diploma in Orthopaedic Technology or its equivalent a recognized institution.</p>

	Technologist)	<ul style="list-style-type: none"> ➤ Taking measurements involving tape and plaster casting; ➤ Fabricating and assembling prosthetic/orthotic devices; ➤ Assessing patients' needs; ➤ Preparing and fitting orthopaedic appliances; ➤ Verifying and maintaining information relating to patients; ➤ Maintaining records of supplies. 	
20	Physiotherapists / Cardiac Therapist	<ul style="list-style-type: none"> ➤ Screening, assessing, rehabilitating and providing therapeutic exercises; ➤ Verifying and maintaining information relating to patients; ➤ Designing treatment plans; ➤ Writing patient case notes and collecting statistics; ➤ Collecting data for operational research; ➤ Sensitizing the community on Physiotherapy issues; and ➤ Preparing periodic reports. 	Diploma in Physiotherapy or equivalent qualification from a recognized institution.

21	Occupational Therapists Existing Job Title Speech Therapists	<ul style="list-style-type: none"> ➤ Providing occupational therapist services to patients; ➤ Assessing and formulating patients treatment plans; ➤ Examining and assessing patients’ needs; ➤ Rehabilitation and habitation through simulated activities; ➤ Verifying and maintaining information relating to patients; ➤ Maintaining records and data relating to patients; ➤ Collecting data for operational research; ➤ Sensitizing on occupational therapy issues; and ➤ Preparing periodic reports. 	Diploma in Occupational Therapy or equivalent qualification from a recognized institution.
22	Medical Imaging Technologists/Radiographers Existing Job Titles <ul style="list-style-type: none"> ➤ MRI ➤ Radiography therapists ➤ CT-SCAN ➤ Ultrasonographer ➤ PET SCAN ➤ Computed Therapists ➤ Radiation Therapy Technologist 	<ul style="list-style-type: none"> ➤ Providing radiographic services to patients; ➤ Processing, verifying and maintaining information relating to patients; ➤ Ensuring supply of radiographic and photographic equipment; ➤ Preparing medical examination rooms for patients; and ➤ Positioning patients for imaging. 	Diploma in Diagnostic or Therapeutic Radiography or equivalent qualification from a recognized institution.

23	Radiation Safety Officers	<ul style="list-style-type: none"> ➤ Nuclear and Radiation Safety Standards ➤ Monitoring radiation and radioactivity levels in the environment. ➤ Radio-analysis of consumables and other imports/exports ➤ Calibrating nuclear instruments ➤ Monitoring of disposal of radioactive materials. ➤ Protecting the public against ionizing radiation. ➤ Responding radiological emergencies ➤ Authorizing for transport of radioactive materials. 	Bachelor of Science degree in Radiophysics, Biophysics, Radiochemistry, Medical Physics, Health Physics and Physical Sciences with topics in atomic, radiation nuclear sciences and nuclear engineering from a recognized university.
24	Medical Physicists	<ul style="list-style-type: none"> ➤ Planning treatment of cancer patients; ➤ Performing radiation dosimetry work; ➤ Performing both diagnostic and therapeutic procedures for cancer patients; ➤ Administrating radioactive drugs to patient undergoing diagnosis or therapy under a specialist's prescription; and ➤ Coaching, mentoring, guiding and counseling of staff. 	A Bachelor of Science degree in Physics or Engineering, Medical Physics/Health Physics from a recognized institution;

25	Pharmaceutical Technologists	<ul style="list-style-type: none"> ➤ Dispensing drugs/medicines to patients; ➤ Receiving, interpreting, and processing prescriptions; ➤ Recording prescriptions in a pharmacy unit; ➤ Pre-packing, repacking and writing instructions on labels; ➤ Educating patients on usage of drugs; ➤ Maintaining drug registers/books; ➤ Stock-taking of drugs and medicinal devices on monthly basis; and ➤ Consulting with seniors on drug issues. 	Diploma in Pharmacy or its equivalent qualification from a recognized institution approved by the Pharmacy and Poisons Board.
26	Nutrition and Dietetics Officers	<ul style="list-style-type: none"> ➤ Preparing and implementing therapeutic diets for outpatients and inpatients; ➤ Providing guidelines on therapeutic diets for existing and emerging diseases for Hospital use and home-based care; ➤ Treating and counseling patients using specialized dietetic nutritionally modified products; ➤ Implementing the nutrition and dietetic process including screening; ➤ Assessing, formulating and implementing nutrition interventions and evaluating outcomes; 	Diploma in any of the following disciplines; Community Nutrition, Clinical Nutrition or Nutrition and Dietetics or equivalent qualification from a recognized institution.

		<ul style="list-style-type: none"> ➤ Providing nutrition support in patient management; ➤ Developing and disseminating nutrition behavior change communication, information and education materials; ➤ Attending Doctors' ward rounds and giving technical advice; ➤ Implementing nutrition health programmes; ➤ Collecting and compiling nutrition and dietetic data; and ➤ Preparing reports. 	
27	Medical Social Workers	<ul style="list-style-type: none"> ➤ Formulating, interpreting, implementing and reviewing Medical Social Work policies, guidelines, standards and procedures; ➤ Coordinating and implementing of all Medical social work activities; ➤ Collaborating with other health care professionals, and government agencies to assess clients need and to plan treatment; ➤ Adhering to and application of the children act, chapter 141 of the Kenyan law to protect and provide for safe shelter of vulnerable children; ➤ Organizing support groups and empower family members to assist them in 	Diploma in Medical Social Work from a recognized institution.

		<p>understanding, how to deal with, and support their patient(s);</p> <ul style="list-style-type: none"> ➤ Identifying environmental and other impediments to client or patient treatment and healing progress in order to appropriately intervene; ➤ Identifying and refer patients, clients, or family to available community resources that can assist in recovery from mental or physical illness 	
28	Clinical Counseling Psychologist /	<ul style="list-style-type: none"> ➤ Provide guidance and counseling services to staff and patients. ➤ Organize sensitization workshops on guidance and counseling; ➤ Provide appropriate interventions to assist patients and employees with work related problems; ➤ Provide assistance in identifying patients and staff social, psychological or health related problems and providing appropriate interventions/advice; and ➤ Provide specialized guidance and counseling assistance to clients in liaison with other stakeholders. 	Diploma in Counseling or its equivalent qualification from a recognized institution.

29	Patient Safety Officers	<ul style="list-style-type: none"> ➤ Ensure that the patient safety and quality activities are aligned with the strategic goals of the hospital. ➤ Assess current activities in patient safety and quality to clarify responsibilities and reduce duplication of effort. ➤ Establish a structure that ensures that patient care activities are addressed in a coordinated manner involving the patient safety, risk, and quality functions. ➤ Seek guidance to ensure that the structure for patient safety and quality activities maximizes legal protections while allowing for the flow of information across all functions. ➤ Seek to coordinate and streamline process changes, data collection, data analysis, monitoring, and evaluation. ➤ Periodically evaluate the roles of patient safety and quality as the hospital's needs change. ➤ Ensure patient related incidents are properly handled, well investigated to find the root causes that led to the incident and implement systems improvement to prevent other occurrences. ➤ Prevent accidents by applying risk management through 	<p>Bachelor's Degree in Nursing OR Bachelor's degree in medicine and surgery OR any other health related field</p>
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		<p>the hospital to identify risks and prevent related accidents.</p> <ul style="list-style-type: none"> ➤ Support/offer continuous patient safety education and training to staff. 	
30	Infection Prevention Control Officers	<ul style="list-style-type: none"> ➤ Promoting quality of care and patient safety through Prevention of Hospital Acquired Infection (HAIs) via; ➤ Advocating for Patient and occupational health and safety practices ➤ Educating and monitoring appropriate Health care waste management (HCWM) ➤ Conducting Surveillance, Research and Implement notification ➤ Ensuring availability of IPC Supplies, Equipment and Infrastructure ➤ Monitoring and Evaluation for IPC 	Higher Diploma in any nursing disciplines.
31	Theatre Services Assistants (TSA) / Anaesthetic Assistants	<ul style="list-style-type: none"> ➤ Assisting staff with the movement of patients within the operating theatre; ➤ Maintaining procedure room/operating theatre equipment so as to ensure a clean, safe and efficient environment for patients and staff; ➤ Ensuring operating room table is wiped down, floor clean, linen and rubbish removed at conclusion of each procedure; ➤ Ensuring that patient is positioned securely and 	Certificate in Theatre / Anaesthetic Technician course or its equivalent qualification from a recognized institution.

		<p>safely on the operating table prior to surgery and on the patient trolley at the completion of surgery;</p> <ul style="list-style-type: none"> ➤ Providing assistance to medical and nursing staff; ➤ Promoting patient safety at all times. 	
32	<p>Sterile Services Assistants (SSA) /Central Sterile Services (CSS)</p>	<ul style="list-style-type: none"> ➤ Collecting and returning all necessary equipment for the procedure and patient safety; ➤ Reporting malfunctioning instruments; ➤ Cleaning instruments/decontamination processes; ➤ Assembling of operating instruments/set; ➤ Wrapping items for sterilization; ➤ Sterilizing instruments and items for surgery; ➤ Monitoring movement of sets and packs in the theatre; ➤ Storing of sterile sets and packs; and ➤ Issuing sterile sets and packs to operating room staff and maintenance of records. 	<p>Certificate in Sterile Technician course or its equivalent qualification from a recognized institution.</p>
33	<p>Mortuary Attendants Existing Job Titles</p> <ul style="list-style-type: none"> ➤ Morticians ➤ Embalmers ➤ Undertakers ➤ Farewell home attendants ➤ Cremators 	<ul style="list-style-type: none"> ➤ Collecting bodies from wards; ➤ Admitting bodies to the Farewell Home; ➤ Documenting and recording of data; ➤ Identifying medico-legal cases; ➤ Preparing bodies for burial including embalming; ➤ Reconstructing of 	<p>Certificate in Mortician course or its equivalent qualification lasting not less than six (6) months from a recognized institution.</p>

		<p>deformed parts of the bodies;</p> <ul style="list-style-type: none"> ➤ Cleaning and dressing of the bodies; ➤ Undertaking beautification, shaving, cosmetic/make-ups and plaiting; ➤ Assisting pathologist in Autopsy/postmortems; ➤ Cleaning equipment and instruments used in the Farewell Home; ➤ Guiding students on attachments/visits; ➤ Harvesting of body organs, fingerprints, fluids and specimens for forensic study; ➤ Removing foreign implants in the body; and ➤ Helping relatives in the identification of unknown bodies. 	
34	<p>Electrocardiogram Technologists</p> <p>Existing Job Title</p> <ul style="list-style-type: none"> ➤ Cardiac Sonographers 	<ul style="list-style-type: none"> ➤ Receiving scheduled patients for ECG/ETT (Electrocardiography and exercise treadmill test); ➤ Preparing patients for procedure; ➤ Informing patients about the procedures; ➤ Performing ECG/ETT procedures; ➤ Interpreting ECG/ETT reports and referring patients appropriately; ➤ Responding to emergency cases in the wards and other units i.e. (myocardial infaction, SVTS, VT, Atrial fibrillation etc) and inform the concerned doctors; ➤ Counseling of patients; ➤ Providing health education to patients 	Diploma in ECG Technology or its equivalent qualification from a recognized institution.

		<p>and staff; and</p> <ul style="list-style-type: none"> ➤ Teaching medical students, interns and nurses on ECG emergencies. 	
35	Electroencephalography Technologists (EEG)	<ul style="list-style-type: none"> ➤ Recording and analyzing small electrical signals. ➤ Diagnosis of various neurological disorders ➤ Perform technical aspects Electroencephalography using modern Neurophysiological equipment. 	Diploma in Electroencephalography from a recognized institution.
36	Auxillary Personnel / Patient Porters	Assisting other health professionals in the delivery of services as delegated	Certificate in the area of specialization or its equivalent qualification lasting not less than one(1) month from a recognized institution
37	Community Oral Health Officers	<ul style="list-style-type: none"> (i) Promotion of oral health services (ii) Planning and Co-ordination of oral health awareness (iii) Conduct Dental check-ups (iv) Carry out basic community oral health status surveys (v) Conducting chemical tests and analysis on water samples to determine fluoride content, interpreting the results of the tests and offering relevant oral health advice to the authorities and communities and diagnosing and treating of common dental (vi) Teaching, training, counseling and giving guidance to community oral health students in medical training. 	Diploma in Community Oral Health

38	Medical/Dental Officer	<ul style="list-style-type: none"> (i) Taking care of patients and managing Health Services and VCT Centres in the college. (ii) Supervision of staff under him and will cover various disciplines of medical care including internal medicine, pediatrics, surgery, dental health, obstetrics and gynecology. (iii) Manage patients; (iv) Maintain patients' records; (v) Supervise staff. 	Bachelor of Medicine and Bachelor of Surgery or its equivalent qualification from a recognized institution; or Bachelor of Dental Surgery or its equivalent qualification from a recognized institution;
39	Medical Engineering Technologist	<ul style="list-style-type: none"> (i) Maintenance and repair of equipment; (ii) Ordering of spare parts and consumables; (iii) Calibration of equipment; (iv) Supervision and training of staff and students on attachment in the workshop. 	(i) Higher Diploma in Medical Engineering from a recognized institution
40	Health Records and Information Technologist	<ul style="list-style-type: none"> (i) Receive, register and schedule patients; (ii) Maintain patients' master index; (iii) Prepare patients' appointments; (iv) Initiate patients' medical records; (v) Store and retrieve medical records; (vi) Code and index diseases and surgical procedures; 	Certificate in Health Records and Information Technology from Kenya Medical Training

		(vii) Collect medical statistics.	
41	Public Health Officers	(i) Participate in immunization programmes; (ii) Site compost pits for refuse disposal; (iii) Site of pit latrines and supervise their construction; (iv) Inspect water storage facilities; (v) Vectors and rodent control.	Certificate in Public Health technician or its equivalent qualification from a recognized institution;
42	Community Health Assistants /Community Health Workers/Volunteers	i. Providing informal counseling, support and follow-up. ii. Advocating for local health needs. iii. Providing health services, such as monitoring blood pressure and providing first aid. iv. Making home visits to chronically ill patients, pregnant women and nursing mothers, individuals at high risk of health problems and the elderly.	A certificate in Community Health

1.2.3.3 Seminar Papers

- Ministry of Labor and Social Protection; State Department for Manpower Planning; Member of the task team for the revision of Kenya National Occupational Classification Standard (KNOCS-2000). The workshop was held from 8th – 11th December, 2020 at Paradise Inn Resort, Mombasa County, Kenya.
- KEBS/STA/16/16; Member of the Occupational Safety and Health Technical Committee (KEBS TC 144 SC2 – OSH Technical Committee) from 5th August, 2016

1.2.3.4 Student Co-authored Publications

Risk Factors Associated with Artisanal and Small-scale Gold Mining in Rosterman, Kakamega, Kenya

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Abstract Occupational injuries, though preventable, have been described as a major public health problem. In artisanal and small-scale gold mining (ASGM), little is known about the risk factors to injuries. In 2018, we examined injuries and the potential risk factors among ASGM workers in Rosterman, Kakamega County, Kenya. A descriptive cross-sectional survey was conducted and three hundred and thirteen (313) ASGM workers were interviewed regarding their occupational injuries experiences over the preceding 1 year. Data was collected using structured interviewer administered questionnaires with the aid of open data kit (ODK) platform. Injury rates were estimated at 44.7 injuries per 100 person years. The most affected body parts were hands, upper and lower limbs at 62.14%, 30% respectively. The risk factors associated with injuries included; having an alternative source of income($p=0.027$), an individual personal safety culture ($p=0.021$) and use of hammer or mallet as tools($p=0.022$). In conclusion, injuries are prevalent among ASGM workers with several body parts being affected, the upper limbs being the most commonly affected. The study also demonstrated that there are various risk factors associated with injuries in ASGM. In view of those findings, the study recommends that injury prevention should be made a priority in ASGM intervention programs in order to reduce the burden of occupational injuries and also sensitize the workers on the risk factors they are exposed to.

Keywords Artisanal small-scale gold mining, ASGM, ASM, occupational injuries, mining, occupational health and safety, Rosterman, Kakamega

1. Introduction

With an increasing demand for minerals and precious metals in growing economies, artisanal and small-scale mining(ASM) has proliferated worldwide, practiced in about 50 countries [1]. Close to 100 million people are dependent on it for their livelihood and in rural Africa it supports several hundred thousand households [1,2]. In Kenya, it is estimated that approximately 140,000 people are engaged in ASM and about 800,000 people depend on it for their livelihood [3]. In 2013, it was estimated that Kenya's gold production was 3.6 tonnes with most of it originating from the artisanal and small-scale gold mining (ASGM) sector. In Rosterman, ASGM begun post 1952 after the colonial British mining company stopped their operations. The community in the area have since been mining the tailings of the abandoned sites as a source of livelihood [4]. The type of mining in Rosterman is both alluvial and hard rock mining [4]. The process of alluvial ASGM begins with digging ore from some sections of River Isiukhu where it is slow moving. The excavated ore is then processed through panning or sluicing. Hard rock mining on the other hand involves going underground through vertical or inclined narrow shafts in order to access the ore body. Using various tools such as picks, mallets, mattocks, chisels, hammers, shovels, the miners loosen the ore, excavate it, transport it through the shaft in sacks or

buckets for further mechanical processing [4,5]. The ore is then grounded using hand held mortar and pestle, in some cases by mallet into smaller pieces or by generator powered grinding machines. The fine powder is then sifted over a piece of cloth while the big pieces are re-ground and re-sifted.

Despite ASGM being a common economic activity, its casual nature of operations has often led to neglecting good occupational health and safety practices thus making it a source of accidents that result in injuries [6]. Other than the casual nature of operations, workers engaging in ASGM have been reported to be lacking in skills, training, knowledge and with limited resources to enable them to practice the trade safely [5,7]. Though not widely documented, the physical conditions, accompanied processes, and activities in ASGM are hazardous and are a concern for work-related injuries [5]. Some of the conditions that have led to injuries in ASGM include being struck by an object, falling, machinery and tools [5].

The International Labour Organization (ILO), estimated that non-fatal accidents are 6 to 7 times more common in small scale informal mines than in large scale organized mines [8]. In Kenya, ASGM has had a long standing illegal status up until 2016 when the repealed Mining Act CAP 306 of Kenyan laws that were in use since 1940 during the colonial period was replaced with the Mining Act no. 12 of 2016. In this new piece of legislation, ASGM is recognized and in section 98 sub-sections 2 and 3 there is a

1.2.3.5 Other Publications

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1.3 Research

Research and Publication

In pursuit of higher education

January 2010 – June 2011

A thesis undertaken in partial fulfilment for the degree of Master of Science (M.Sc.) in Occupational Safety and Health in the Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya.

Thesis title **“Impact of Integrating Road Safety Measures in Multiple Hauling Companies, Kenya”**. A case study of Nairobi Multiple Hauling Companies

Research Papers presented

1) November 2008

Research Project Title

“The interaction between musculoskeletal disorders and the psychosocial work environment”

A case study of manufacturers of automobile leaf springs and assemblies in Kenya

A paper presented at the Institute for Energy and Environmental Technology (IEET), Jomo Kenyatta University of Agriculture & Technology, Kenya

2) May 2009

Research Project Title

“The changing world of work and its impact on health and safety”

A case study of the flower firms in Kenya.

A paper presented at the Institute for Energy and Environmental Technology (IEET), Jomo Kenyatta University of Agriculture & Technology, Kenya.

A research project report presented at the Kenya Institute of Management for the award of a diploma in business management.

1.4 Funded Projects

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1.5 Conference/Workshops/Seminars Attended

See the above

1.5.1 Conferences Attended

See the above

1.5.2 Workshops Attended –Environmental and Occupational Health Workshop, Kenyatta University- held on 23rd February, 2018.

1.5.3 Seminars Attended - Capacity building seminar for staff mentors, Kenyatta University- held on 26th January, 2018.

1.6 Supervision of Postgraduate Students

1.6.1 Masters

29 Masters Students that am supervising for their thesis

1.6.2 Ph. D

None, so far

1.7 Professional/Consultancy (Editor/Peer review in journals, Networks/Collaborations, External Examiner, Patents)

- Lecturer, Kenyatta University, Environmental and Occupational Health Department, from September, 2017 to date.
- Tutorial Fellow, Kenyatta University, Environmental and Occupational Health Department, from September, 2012 – 2016.
- 2010-2011; Continuous Improvement Management Services (CIMS) Ltd; Conducted consultancy work on establishment, implementation and documentation of BS OHSAS 18001: 2007 i.e. an Occupational Health and Safety Management System.
- 2008-2009; ALARP Safety and Environment Consultants; Lead Consultant in the provision of advisory services to organizations regarding the Occupational Safety, Health and

Environment industry “best practice”. The main tasks in this case were to conduct extensive review of existing policies and programs on the current status of Occupational Safety, Health and Environment in the workplaces

- The table below shows some statutory safety and health advisory services that I have rendered to organizations listed below:

Agency/Organization/Client	Assignment Name	Year (s)	Designation	Responsibilities
Mwalimu National Savings and Credit Co-Operative Society Limited	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments • Safety and health committee training 	March 2020	Safety and health adviser/Auditor	To establish the level of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations and finally train the members of safety and health committee
IBM Research Africa, Nairobi County, Kenya Cuea, Karen Campus, Langata Road, Nairobi County, Kenya	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments 	July 2019	Safety and health adviser/Auditor	To establish the levels of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations
Oxfam Kenya. The Atrium, Chaka Road, Kilimani, Nairobi, Kenya P.O. box 40680, 00100 (GPO) Nairobi	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments 	March, 2018	Safety and health adviser/Auditor	To establish the levels of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations
De La Rue Currency and Security Print (K) Ltd, Noordin Road, Off Thika , Nairobi, Kenya	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments 	July, 2018	Safety and health adviser/Auditor	To establish the levels of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations

P.O. Box 38622 - 00623, Nairobi, Kenya	<ul style="list-style-type: none"> • Fire Safety Audit 			
Teledata Technologies Ltd, Mombasa Road, Industrial Area- Nairobi, P.O Box 40826-00100 Nairobi Kenya.	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments • Fire Safety Audit 	January, 2017	Safety and health adviser/Auditor	To establish the levels of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations
Delta Energy Systems (K) Ltd Mombasa Road, Industrial Area- Nairobi, P.O Box 26765-00100 Nairobi Kenya	<ul style="list-style-type: none"> • Statutory safety, health and welfare audits • Safety and health risk assessments • Fire Safety Audit 	May, 2017	Safety and health adviser/Auditor	To establish the levels of compliance with the Occupational Safety and Health Act (OSHA), 2007 and its relevant subsidiary legislations

1.8 Community Service and Other Engagements

- **Chairman**, Board of Management, St. Bridged Girls Secondary School, Syomunyu, Lower Yatta, Kitui County, Kenya.
- **Patron**, Association for Childhood Education, Kenya (ACEK). The Association for Childhood Education, Kenya, is a vibrant National Community of Educators and advocates for Childhood Education Reforms.

1.9 Affiliation of Professional Bodies

- **Approved Safety and Health Adviser (Certificate OSH/ADV 075)**; Ministry of Labour and Social Protection; Directorate of Occupational Safety and Health Services; Approval Certificate No. OSH/ADV 075)
- National Environment Management Authority (NEMA) registered as an **Environmental Impact Assessment Expert** in accordance with the provisions of Environmental Management and Coordination Act (EMCA, 1999) to practice in the capacity of a **lead expert (Certificate No. 2288)**
- Ministry of Labour and Social Protection; State Department for Manpower Planning; **Member of the task team** for the revision of **Kenya National Occupational Classification Standard (KNOCS-2000)**
- **KEBS/STA/16/16**; Member of the Occupational Safety and Health Technical Committee (KEBS TC 144 SC2 – OSH Technical Committee) from 5th August,2016

2.0 National and International awards and Recognitions

- **Approved Safety and Health Adviser (Certificate OSH/ADV 075)**; Ministry of Labour and Social Protection; Directorate of Occupational Safety and Health Services; Approval Certificate No. OSH/ADV 075)
- **National Environment Management Authority (NEMA)** registered as an **Environmental Impact Assessment Expert** in accordance with the provisions of Environmental Management and Coordination Act (EMCA, 1999) to practice in the capacity of a **lead expert (Certificate No. 2288)**
- **Ministry of Labour and Social Protection**; State Department for Manpower Planning; **Member of the task team** for the revision of **Kenya National Occupational Classification Standard (KNOCS-2000)**
- **KEBS/STA/16/16**; Member of the Occupational Safety and Health Technical Committee (KEBS TC 144 SC2 – OSH Technical Committee) from 5th August,2016

2.1 Administrative Positions Held

2.1.1 Recognized university administrative positions

- School Examinations Coordinator (School of Public Health and Applied Human Sciences
- Appointment as a Member, Departmental Marks verification Committee (Department of Environmental and Occupational Health), from 13th June, 2016.
- Academic Staff Mentor, Kenyatta University, School of Public Health and Applied Human Sciences), from 18th November, 2018.

2.1.2 Other administrative positions Held

- Occupational Safety and Health Advisory Services regarding the best practice in occupational safety and health training curriculum.

