A SITUATIONAL ANALYSIS ON PHARMACEUTICAL WASTE MANAGEMENT IN NAIROBI COUNTY, KENYA

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24th November 2015
UNIVERSITY OF NAIROBI

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2. I declare that this dissertation is my original work and has not been submitted elsewhere for examination, award of a degree or publication. Where other people’s work, or my own work has been used, this has properly been acknowledged and referenced in accordance with the University of Nairobi’s requirements.

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APPROVAL

This dissertation has been submitted for examination with the approval of the following university supervisors.

……………………………………..

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ABSTRACT

Pharmaceutical waste (PW) includes pharmaceuticals that are no longer needed but it also includes containers and other used items that may contain remnants of pharmaceutical substances. Pharmaceutical waste management (PWM) is defined as all activities, both administrative and operational, for handling PW. Poor PWM may be deleterious to both human health and the environment. In the hospital set up, pharmaceutical waste is managed as part of healthcare waste (HCW) in accordance with the existing guidelines. Similar guidelines for PWM in community pharmacies are lacking.

The aim of this study was to describe the prevailing situation of PWM in Nairobi County, Kenya. A total of 477 community pharmacies were listed through mapping in 26 out of 85 wards, selected through cluster sampling. A self administered structured questionnaire was used for data collection among the selected participants. The response rate was 57%.

The respondents were categorized as either good or poor (adequate or inadequate) according to their respective scores. Chi square was used to determine associations. Over 70% of respondents were adequately qualified to practice sound PWM. About 62% of participating CPs had access to adequate disposal infrastructure. About 79% of the respondents had adequate knowledge of PWM while 66% of pharmacies had ‘good practice’. However, the proportion of CPs with poor PWM practice was significant (34%). Knowledge of PWM was associated with manager qualification while practice was associated with both access to infrastructure and knowledge of PWM.

The situation of PWM was therefore generally good but there was room for improvement. It was recommended that the Pharmacy and Poisons enhances law enforcement to eliminate unqualified practitioners. Enlightenment of CP managers on PWM through continuous medical education (CME) was also recommended.
ACKNOWLEDGEMENTS

I would like to acknowledge the following people who contributed in different ways to the successful completion of this dissertation.

1. My two supervisors Ms. Mary Kinoti and Dr. Dismas Ongore both of who guided and encouraged me all the way.

2. All my lecturers who imparted me with the knowledge in class.

3. My ever supportive wife, Veronica Njeri Kimata, who not only took my role at home and work but also provided for me in many ways.
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23rd September 2014

To whom it Concerns

Dr. John Rukungu Magumura – Pharmacist of Reg.No.1175

The above named is a masters student at the University of Nairobi and is carrying out a study on Pharmaceutical waste management. He therefore needs to collect information from community pharmacies. Kindly assist him as necessary.

Thank you for your cooperation.

Yours Faithfully,
Pharmaceutical Society of Kenya

[Signature]

Dr Paul Mwaniki
President

Pharmaceutical Society of Kenya
P.O. Box 817250-00103
GPO Nairobi, Kenya

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<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>APIs:</td>
<td>Active Pharmaceutical Ingredients</td>
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<tr>
<td>CME:</td>
<td>Continuing Medical Education</td>
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<td>CP:</td>
<td>Community Pharmacy</td>
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<tr>
<td>DEA:</td>
<td>Drug Enforcement Authority</td>
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<tr>
<td>Deff:</td>
<td>Design effect</td>
</tr>
<tr>
<td>EE2:</td>
<td>Ethinylestradiol</td>
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<tr>
<td>EMCA:</td>
<td>The Environmental Management and Co-ordination Act</td>
</tr>
<tr>
<td>FEFO:</td>
<td>The first to expire – first out principal for inventory management</td>
</tr>
<tr>
<td>GPWR:</td>
<td>Global Pharmacy Workforce Report</td>
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<tr>
<td>HCW:</td>
<td>Health Care Waste</td>
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<tr>
<td>HCWM:</td>
<td>Health Care Waste Management</td>
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<tr>
<td>HFs:</td>
<td>Healthcare Facilities</td>
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<td>ICF:</td>
<td>Informed Consent Form</td>
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<td>ICRC:</td>
<td>International Committee of the Red Cross</td>
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<tr>
<td>IEBC:</td>
<td>Independent Electoral and Boundaries Commission</td>
</tr>
<tr>
<td>IFP:</td>
<td>International Pharmaceutical Federation</td>
</tr>
<tr>
<td>KNBS:</td>
<td>Kenya National Bureau of Statistics</td>
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<tr>
<td>KPA:</td>
<td>Kenya Pharmaceutical Association</td>
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<tr>
<td>MoH:</td>
<td>Ministry of Health</td>
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<tr>
<td>MSc:</td>
<td>Master of Science</td>
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<tr>
<td>NGO:</td>
<td>Non-governmental Organization</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>NMRQ:</td>
<td>Nicholson McBride Resilience Questionnaire</td>
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<td>NRDC:</td>
<td>Natural Resources Defence Council</td>
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<td>Pharm.D:</td>
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<td>PhD:</td>
<td>Doctor of Philosophy</td>
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<tr>
<td>PI:</td>
<td>Principle Investigator</td>
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<td>POPs:</td>
<td>Persistent Organic Pollutants</td>
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<td>PPB:</td>
<td>Pharmacy and Poisons Board</td>
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<tr>
<td>PSK:</td>
<td>Pharmaceutical Society of Kenya</td>
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<td>PSP4H:</td>
<td>Private Sector Innovation Programme for Health</td>
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<td>PSU:</td>
<td>Primary Sampling Unit</td>
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<tr>
<td>PVC:</td>
<td>Polyvinyl Chloride</td>
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<td>PW:</td>
<td>Pharmaceutical Waste</td>
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<td>Pharmaceutical Waste Management</td>
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<td>RA:</td>
<td>Research Assistant</td>
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<td>SPSS:</td>
<td>Statistical Product and Service Solutions</td>
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<tr>
<td>SSU:</td>
<td>Secondary Sampling Unit</td>
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<tr>
<td>TFDA:</td>
<td>Tanzania Food and Medicines Authority</td>
</tr>
<tr>
<td>UK:</td>
<td>United Kingdom</td>
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<tr>
<td>UNEP:</td>
<td>United Nations Environment Programme</td>
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<td>US:</td>
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<td>WHO:</td>
<td>World Health Organisation</td>
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DEFINITION OF OPERATIONAL TERMS

**Community pharmacy:** The term “community pharmacy” includes all those establishments that are privately owned and whose function, to varying degrees, is to serve societies’ needs for both drug products and pharmaceutical services (Rakesh and Kumar, 2012).

**Encapsulation:** Immobilization of waste by stuffing containers with the waste, adding an immobilizing material, and sealing the containers (WHO).

**Genotoxic waste:** Cytotoxic waste containing substances with genotoxic properties (e.g. waste containing cytostatic drugs, often used in cancer therapy) (WHO).

**Hazardous waste:** Waste that poses a variety of environmental and/or health risks (WHO).

**Healthcare waste:** Health-care waste includes all the waste generated within health-care facilities, research centres and laboratories related to medical procedures. In addition, it includes the same types of waste originating from minor and scattered sources, including waste produced in the course of health care undertaken in the home (WHO).

**Inertization:** Immobilization of waste by mixing it with cement and other substances to make it stable and minimize migration of toxic substances into surface water or underground water (WHO).

**Pharmaceutical waste:** Pharmaceutical waste includes pharmaceuticals that are expired or no longer needed and/or items contaminated by or containing pharmaceuticals. Also includes genotoxic waste (WHO).
**Waste management:** The activities, administrative and operational, that are used in handling, packaging, treatment, conditioning, reducing, recycling, reusing, storage and disposal of waste [Environmental Management and Co-ordination (Waste Management) Regulations 2006].