Lebanese Sterilization Network

Health Care Waste

A national public health success story
Health Care Waste

“Medical Waste” refers to materials accumulated as a result of patient diagnosis, treatment or immunization of human beings
Health Care Waste

- health care waste (HCW)
  - hazardous healthcare waste (HHCW) ~ 30%
  - waste comparable to household waste (HCHW) ~ 70%
  - potentially infectious health care waste (PIHHCW) ~ 25%
  - non infectious hazardous health care waste (NIHHCW) ~ 5%
Potential health hazards and pollution effects of wastes may be categorized as follows:

1. **Infectious wastes containing micro-organisms** capable of causing illness to a susceptible host. Through this path, AIDS, Hepatitis B, C and D, allergies, gastroenteric infections, respiratory infections, skin infections can be transferred.
2. **Physically injurious wastes** that can produce punctures, cuts, or abrasions.
3. **Flammable liquids and explosive gases** that can cause injury to personnel or damage to the hospital structure by fire and explosion.
4. **Acids or Base** that can cause injury.
5. **Radioactive** contaminated wastes.
6. **Toxic chemicals** that can cause poisoning when inhaled ingested or brought into contact with the skin.
7. **Carcinogens** (cancer-causing agents) in wastes from bio-medical research laboratories.
Health Care Waste

In Lebanon, until 2003, hospital wastes

• Were not segregated at source within hospital

• Have been disposed with the municipal wastes in landfills.

• Eliminated through non controlled incineration

Medical waste can be considered dangerous if thrown away without any safety measures
Health Care Waste

Ministry of environment and Ministry of Public Health

Obliged all lebanese hospitals to treat their waste through:

decree 8006/13389

Hospital accreditation

وزارة البيئة
مرسوم رقم 843/13389

تعديل المرسوم رقم 843/13389

تاريخ 11/6/2003

تحديد انواع نفايات المؤسسات الصحية

وكيفية تصريفها

Accreditation Standards & Guidelines
For Acute Hospitals in Lebanon
HCW in Lebanon: case of study

- Independently of any treatment strategy, waste **segregation** must be considered as one of the most important procedures.

- Management of HCW must start in Hospitals, than small scale producers should be integrated.

- PIHCW must be segregated and treated first.
Health Care Waste

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Many questions should be asked

• Who must be in charge of the PIHCW treatment?

• What technique should be used?

• What is the source of motivation, and what is the cost?

• Who are the real shareholders?
Treatment must be achieved individually by each hospital?

- The mission of health care institutions is to treat the patient.

- Chronically difficult economical situation.

- PIHCW production: only 165 hospitals, less than 0.4% of the solid waste.

- Difficulty of managing a successful coordination between competing institutions in case of failure.

- Profit-making service providers could be too expensive, not interested in reducing waste production.
Management of PIHCW by an NGO

- cost Control, Economy of scale
- competition Control
- ensuring Public funding

Inappropriate assignment zone

- Global & national solutions
- awareness and training
- ensuring Quality Service

Performance zone

Failure zone

- several profit-making companies

Financial blockade zone

- several non profit-making organizations

Strategic axe of preservation of Environment

Strategic axe of Profitability
Incineration: can’t be considered as an optimal solution in Lebanon because of its major drawbacks:

- Local and international refuse
- Possibility of toxic emissions, such as dioxins and furans
- Expensive controls techniques, high investment and operating costs
- Generation of hazardous ashes containing heavy metals that may pollute the soil and water
Treatment by autoclaving coupled with shredding

- Environmentally friendly
- Low investment and operating costs
- Proper sterilization in 40 minutes
- Volume reduction of 80%
- Unrecognizable ground waste assimilated to domestic waste
Methodology for Handling the problem of PIHCW in Lebanon

• A single service provider

• A Non profit organization service provider

• National network with semi centralized centers (5 centers)

• Autoclaving associated to shredding
Methodology for Handling the problem of PIHCW in Lebanon

Hospital → collection → Treatment
Methodology for Handling the problem of PIHCW in Lebanon

• a Lebanese non profit organization

• since 1985, with and for every person in difficulty

• recognized of public utility in 1995

• Mission: participate to society’s lasting development by supporting fragilized groups and integrating marginalized people.

7 programs
Agriculture
Employment
Environment
Health
Rehabilitation
Social
youth
Methodology for Handling the problem of PIHCW in Lebanon
**Result 1: A national network strategy, for an integrated and sustainable solution**

5 treatment centers: semi centralized dispersion

- Secures a back up system
- Reduce costs because of economy of scale, experience/efficacy
- Guaranties a quality and reliable traceability system
- Puts all findings and experience to be used by relevant authorities, universities, NGO in order induce new regulations and laws
### Result 1: A national network strategy, for an integrated and sustainable solution

<table>
<thead>
<tr>
<th>Location</th>
<th>Coverage Region</th>
<th>Funding</th>
<th>Date of Creation</th>
<th>Total number of beds in the region (year 2011)</th>
<th>Beds covered by aec (year 2011)</th>
<th>Percentage of beds aec (year 2011)</th>
<th>Quantities treated (kg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zahle</td>
<td>Bekaa</td>
<td>autofunds</td>
<td>2003</td>
<td>1574</td>
<td>1176</td>
<td>75%</td>
<td>350</td>
</tr>
<tr>
<td>HDF (Beirut)</td>
<td>Hotel Dieu de France</td>
<td>autofunds</td>
<td>2005</td>
<td>342</td>
<td>342</td>
<td>100%</td>
<td>385</td>
</tr>
<tr>
<td>Jisr el-Wati</td>
<td>Beirut and Mount Lebanon</td>
<td>EU (LIFE)</td>
<td>2006</td>
<td>4795</td>
<td>3935</td>
<td>82%</td>
<td>3600</td>
</tr>
<tr>
<td>Zgharta</td>
<td>North Lebanon</td>
<td>AECID</td>
<td>2007</td>
<td>2847</td>
<td>1805</td>
<td>63%</td>
<td>1000</td>
</tr>
<tr>
<td>Saida</td>
<td>South Lebanon</td>
<td>AECID</td>
<td>2009</td>
<td>2200</td>
<td>779</td>
<td>35%</td>
<td>1200</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>11758</strong></td>
<td><strong>8037</strong></td>
<td><strong>80%</strong></td>
<td><strong>6535</strong></td>
</tr>
</tbody>
</table>
Result 1: A national network strategy, for an integrated and sustainable solution

5 treatment centers: semi centralized dispersion

Reduce costs because of

- economy of scale
- experience efficacy

![Graph showing the relationship between cost and kg]
Result 1: A national network strategy, for an integrated and sustainable solution
Result 2: A controlled collect system

- Specially equipped collection vehicles in compliance to the WHO recommendations
- Trained staff
- Occupational health and safety system
- Bins traceability
Results 3: Monitoring and traceability

Treatment monitoring

- cycle reports printed by the autoclave
- chemical tests
- biological tests
Results 4: Consultancy, awareness and training

Training of Health Care Staff: more than 7000 persons trained

- Special training sessions for health care staff (Drs, nurses, cleaning staff, administrative staff)
- Risk prevention
- Emergency procedures
- Sorting at the source and PIHCW minimization: National Guidelines
- Management of NIHHCW
Results 5: Public Awareness
Results 6: Data Analysis

Suivi Chronologique hopital AUH 2009-2010 (T.O=60%)

Suivi Chronologique hopital Sir el Denniyeh 2009-2010 (T.O=60%)
Results 6: Data Analysis

Suivi Chronologique - SUIVI POIDS DASRI - 02/02/11

\[ n = 49 \ y = 814.347 \ s = 313.242 \]

Suivi Chronologique - SUIVI POIDS DASRI - 02/02/11

\[ n = 49 \ y = 10496 \ s = 1825.29 \]
Guide de la gestion des Déchets d’Activités de Soins
Liban
Edition 2014
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