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Ramallah City Industrial Zone: Industries Description, Perception and Work Conditions

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October 2007

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List of Content

List of Tables

List of Figures

Abbreviations

EQA	Environment Quality Authority
MOH	Ministry of Health
MOA	Ministry of Agriculture
MNE	Ministry of National Economics
PSI	Palestinian Standard Institution
PFI	Palestinian Federation of Industries
SPSS	Statistical Package for Social Sciences
EIA	Environmental Impact Assessment
NGOs	Non Governmental Organizations
RR	Response Rate
MOL	Ministry of Labor
MOT	Ministry of Transport
MOF	Ministry of Finance
MOP	Ministry of Planning

Acknowledgment

We would like to acknowledge the help of Ramallah Municipality, Environment Quality Authority, and the Palestinian Federation of Industries who made this project feasible. Thanks are also due to ICPH research assistants and administrative staff for the contribution for the data entry, cleaning and administrative support. Finally, we are grateful for the Swiss Development Cooperation (SDC) for funding the project.

Introduction

It is well known that rapid and unplanned urban growth is associated with poverty, environmental degradation, and negative health outcomes. With about half of the world's population living in urban settlements [1], the problem of environmental degradation and the health of the poor can no longer be neglected. Increasingly, urban poverty is also being feminized, adding to the urgency for the need to generate the data required for effective interventions to ameliorate the problem. Indeed, the literature indicates a noticeable scarcity of studies examining hazardous exposures [2] and their impact of health, especially among the urban poor, and women. Of particular importance is the exposure to industrial wastes, usually mixed and dumped untreated along with municipal waste, or left uncollected from the streets due to inadequate waste management systems [3]. Such industrial wastes are known to introduce noxious materials into the atmosphere and the ecosystem as a whole [4], leading to clear dangers to health, especially among the urban poor. Indeed, the environmental problems intertwine with the social ecology of low-income urban neighborhoods whereby evidence suggests that living under harsh traumatic circumstances, often marred by violence, not only negatively affects health, but can also contribute to the erosion of family processes, most notably those of coping mechanisms [5].

The case of Ramallah city's urban poor is not an exception. The Occupied Palestinian Territory as a whole has witnesses rapid, unplanned and chaotic urbanization during the past 10 years, so much so that today, not less than 55% of the population lives in urban areas, when in 1967, two thirds of the population lived in rural areas [6]. Furthermore, the country, including Ramallah city, has been engulfed in an intensification of conflict, beginning September of 2000, and the increase in poverty levels to unprecedented proportion [7].

A major effect of urbanization on the urban poor is their inability to choose their place of living. The poorer people, by necessity, usually live in neighborhoods that are cheaper to live in, closer to their work to save on commuting, and where public transport is available. The industrial zone in Ramallah City has these characteristics. As in many developing countries, industries were built at the outskirts of towns. However, over time, the outskirts were transformed into the heart of the city [10]. The industrial zone of Ramallah is considered poor by any definitions, including the definition of having lower quality environmental standards than those in other neighborhoods of the city [11]. This can be attributed to three of Ramallah's characteristics: 1) the inefficient wastewater treatment plant ; 2) the unsanitary solid waste dumpsite, and 3) industrial emissions and air emissions due to excessive and congested traffic conditions.

The Ramallah industrial zone houses small industries in the main. Most of the industries employ less than four workers [12]. Industrial establishments can be categorized as small based on either their economic activity [13], workers size [14], or their waste generation size [13, 15]. Industries in Ramallah city are similar to those in other Middle Eastern countries with regards to size and type of manufacturing [16, 17]. There are over 400 industries and workshops in the Ramallah industrial zone [12]. The industrial zone land area is 284 thousand square meters, located in the southern area of the city[1]. The industrial zone is located above the western aquifer, the largest aquifer in the West Bank[2]. Therefore emissions from this zone are a serious threat to this aquifer and should be addressed immediately for this reason as well.

Given that there are two major ongoing projects in Ramallah and al-Bireh Governorate regarding medical waste[3] and municipal solid waste[4], industrial hazardous waste management is the missing component for solving the solid waste problem in Ramallah holistically. Given that there are only two industrial zones in the Governorate, one is located in the City of al-Bireh, the other in the City of Ramallah, the Ramallah city industrial zone was chosen due to previous cooperation between the partner institutions that can guarantee project completion and sustainability.

At the same time, improper waste management has an adverse effect on the health of the people working in the industrial areas, the workers handling the waste and the people residing in the industrial zone [21]. The effects of direct and indirect contact of workers with hazardous wastes are also documented worldwide. Neurological disorders, respiratory diseases and malignancies are the main reported outcomes [22-26]. However, the situation of the current health status of workers, the level of exposure to hazardous waste by the poor and the effect of these wastes on their health have never been documented in industrial zone on the OPT.

The outcome of this study is building the profile of the types of industries operating in Ramallah Industrial zone, documenting the owners/directors perception about laws, official bodies, type of wastes produced and work conditions. Such body of data will hopefully provide the scientific evidence for future policy formulation.

It is believed that if hazardous waste management is addressed in this zone, this will lead to significant improvement of the environmental quality of the area. This is because the proper management of emissions from industries leads to air quality improvement; the load of the industrial wastewater should be reduced, therefore its efficiency will be improved; and the hazardous waste will be dealt with separately from municipal waste, leading to minimizing the hazardous chemicals produced from uncontrolled burning of waste. In the end this project aims to address on urgent environmental problem and assist in improving the living and occupational environment of the urban poor.

[1] Source: Ramallah municipality records.
[2] Source: Environment Quality Authority maps.
[3] Medical Waste Management in Ramallah and al-Bireh Governorate Project.
[4] Solid Waste Management in Ramallah and al-Bireh Governorate Project.

Methodology

Review of Palestinian laws and regulations

Documents of the Palestinian laws and regulations were obtained from the legislation database owned by the Institute of Law at Birzeit University. This database includes a scanned version of the official gazette of the Palestinian National Authority in which all laws, regulations and decrees are published.

Official authorities

Meetings were conducted with the inspection and regulation authorities to identify the extent to which these officials understand the existing laws and their implications on their work, as well as the problems faced in the enforcement of these laws. Meetings were conducted with the Ramallah municipality, Environment Quality Authority (EQA), Palestinian Federation of Industries (PFI), and the Ministry of National Economy (MNE). Interviews took place between October 2006 and February 2007.

Industries

A list of all industries available in Ramallah City was obtained from Ramallah municipality. Almost all industries were clustered in one industrial zone and the mixed activities' zone of the city. Based on the size and location of industries and after discussing the survey catchments area with EQA and the municipality, the survey was restricted to the industrial and mixed zones (Figure 1).

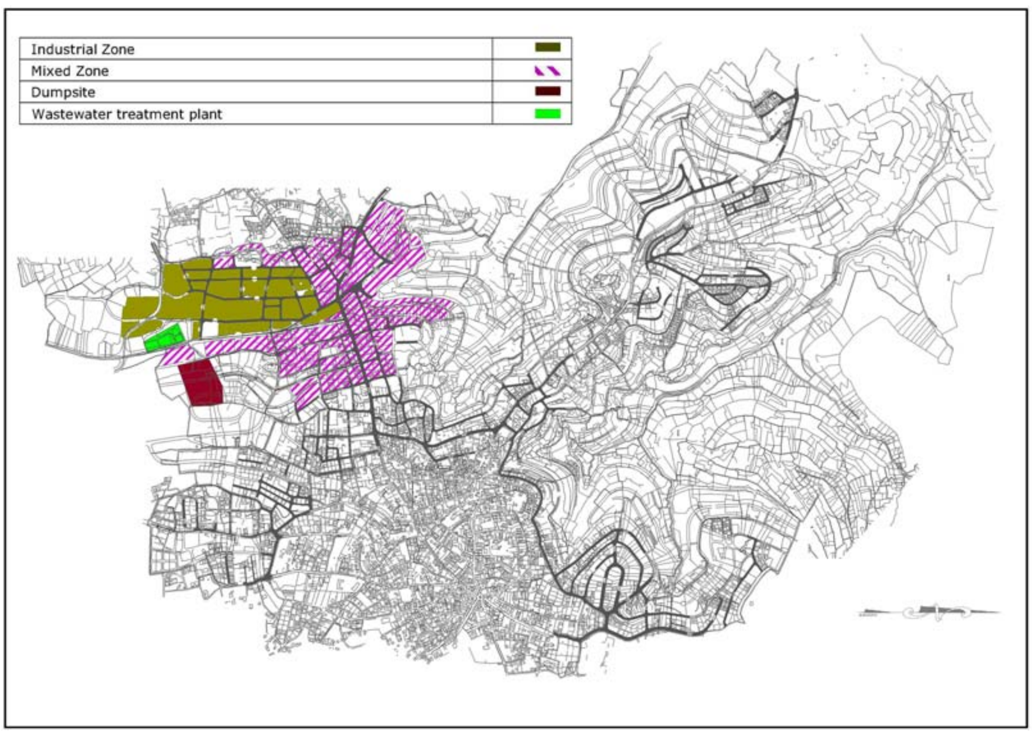

Figure 1: Map of Ramallah City. (Note that the map is rotated 90 degrees to the right).
Source: Ramallah Municipality

The industries' owners or directors were interviewed using semi-structured questionnaires filled by trained fieldworkers. In 9% of the industries, neither the owners nor the managers were available for the interview. In these cases technical staffs such as engineers, production mangers, quality control specialists, or employees or administrators were interviewed instead. The distribution of the respondents' status in the industry is presented in Figure 2.

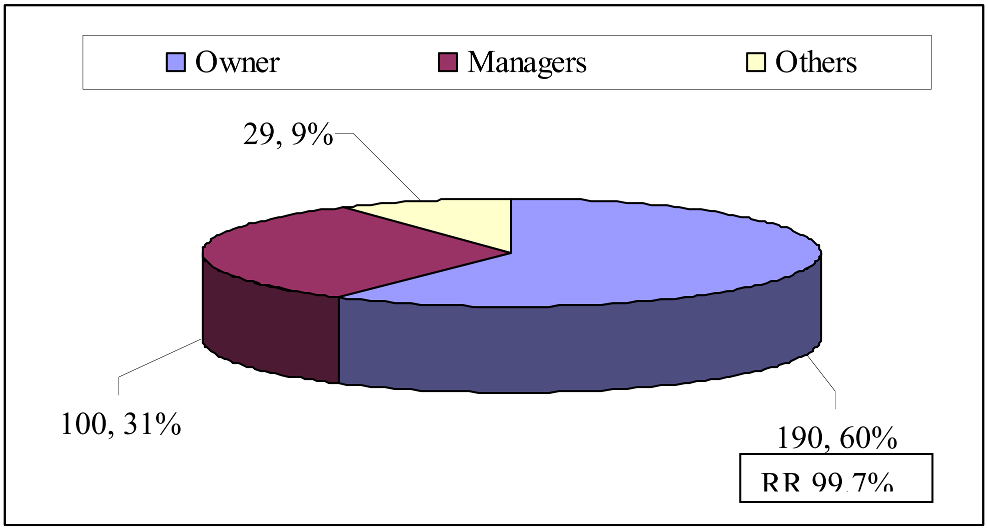

Figure 2: Respondent's status in the industry

The questionnaires investigated several issues including the following: 1) general description of the industry; 2) methods used to handle hazardous waste, 3) industries' owners and directors' knowledge of laws, and obstacles facing the applicability of these laws from the industries' perspective; 4) licensing and inspection agencies, advantages and disadvantages; 5) Role of governmental agencies, unions and other private sector in the industrial; and 6) occupational health and safety.

The fieldwork started on February 20 and completed on March 15, 2007. On the last two days of the fieldwork, screening of industries in the whole area was conducted with the help of municipality inspectors to ensure that the field workers visited all industries listed on the municipality list. Trained research assistants completed the process of coding, data entry and cleaning. Data analysis was completed using the Statistical Package for Social Sciences (SPSS12).

Results and Discussion

Palestinian laws and regulations related to hazardous solid wastes

Environmental issues are regulated by several laws and policies that have been issued by governmental bodies, including the Basic Palestinian Law (i.e. the constitution), the Law on the Environment, The Palestinian Environmental Strategy, and the Environmental Action Program, which stipulate that hazardous wastes should be managed appropriately to ensure public and environmental protection. The Basic Palestinian Law[5] (2003) identifies the right to a clean environment as a basic right of every Palestinian and that preservation of the Palestinian environment for the sake of both present and future generations is a national duty (article 33). Defining clean and safe environment as a human right in the basic law is essential for the further laws issued on the environment, and for the protection of the environmental systems. Also this article indicates the importance of sustainable development, as the environment has to be preserved and protected for the sake of not only present but also future generations.

Oslo Interim Agreement II

The Oslo Interim Agreement II (1995) between the Israeli and Palestinians included articles on environmental protection. The agreement indicates that there will be a transfer of environmental powers and responsibilities to the Palestinian Authority in the environment sphere, including licensing for crafts and industry, and solid waste including hazardous waste. However this transfer is limited to areas A and B, and does not include are C in which transfer of authorities will take place only after the final agreement between the two parties. Therefore, in Ramallah city, which is located in area A, hazardous waste management is within the Palestinians powers. However any potential locations for hazardous waste treatment and disposal are bound to be in area C because of the limits of space in areas A and B therefore requires Israeli approval[6]. The agreement indicates that each side will act to protect the environment and prevent pollution. In addition, both sides agreed to adopt, apply and ensure compliance with internationally recognized standards concerning the use, handling, transportation and storage of hazardous waste, whereby each side was to take necessary measures to promote the proper treatment of solid and hazardous waste.

The role of Environment Quality Authority – the regulating body

The first creation of an environmental official institution was established by a presidential decree on the 10th of December 1996, two years after the establishment of the Palestinian National Authority. The current name of this official organization is the EQA. The main task of EQA is to protect the environment and public health. EQA responsibilities include the development of regulations, strategies, management plans and monitoring programs. The EQA has the authority to monitor the environment and compliance with environmental laws and regulations and their enforcement through sanctions on

[5] Official gazette – Palestinian Facts – special issue, July 2002. page 5-48
[6] Interview with Dr. Khalid Qahman, Assistant Chairman – EQA. 2007.

violations.

The law on environment

The Law on the Environment[7] (1999) provides the general framework for handling hazardous waste in the country. The law is based on the following principles and guidelines:

- every individual has the right to file, follow up any complaint, or appropriate legal procedures against any party causing harm to the environment (Article 3-A);
- every individual has the right to obtain any information to discover the environmental impact of any industrial, agricultural, construction, or other activity (Article 3-B);
- every individual has the right to live in a sound and clean environment and to enjoy the maximum possible public health and welfare (Article 5-a);
- the law guarantees the protection of the countries natural's and economic resources, and preservation of its historical heritage (Article 5-b);
- polluter pays principle: environmental harm must be removed at the expense of the violator of this law (Article 74), in addition to paying the fines as stated per each article violation;
- all by-laws and other implementing rules will be issued by the Ministerial Council (the cabinet) based on the recommendations of the President of the EQA.

This law specifically indicates that the import of hazardous waste is not allowed and that it is not allowed to transport such waste through the country without a special permit from EQA (Article 13). The definition of hazardous materials and waste in this law are:

- Hazardous substance: Any substance or combination of substances, which because of hazardous characteristic, poses a danger to the environment such as toxic, radioactive, biologically infectious, explosive or flammable substances.
- Hazardous waste: Waste generated by the various activities and operation or ashes produced by these activities and operations that preserve the characteristics of hazardous substance such as nuclear waste, medical waste, waste produced from production of pharmaceuticals, medicine, or organic solvents, dyes, paints, pesticides or other similar substances.

The Law on the Environment (1999) indicates that there is a further need to work on classification and listing of hazardous materials and wastes, by stating in article 11 that the EQA, in coordination with other official institutions, will issues such lists. In addition to the above, article 12 in the law forbids any one from handling (manufacturing, storing, distributing, using, treating, disposing) hazardous waste or material without approval and based on the bylaws and instructions that will be issued by EQA. Articles 11 and 12 provide an excellent framework for identifying hazardous waste material and their management. These by-laws have not been issued yet, as had they been approved, they would have had to be approved by the ministerial cabinet and published in the official gazette. This was confirmed by the interviews with the EQA employees, who also maintained that such by-laws are in the making[6]. It is worthwhile mentioning that a draft of bylaws as specified in articles 11 and 12 is undergoing. However, there are major

[7] Official gazette – Palestinian Facts – February, 2000. page 38-70.

obstacles facing drafting these by laws, such as the lack of human resources and weak institutional setting[6]. The need for these lists is urgent, because management of hazardous wastes and materials is based on personal judgment and knowledge of producers and users.

Public Health Law[8]

Article 42 of the law states that the Ministry of Health shall coordinate with the relevant bodies to determine conditions for:

A. transfer, storage, treatment or disposal of hazardous items
B. usage and exchange of pesticides for agricultural and public health purposes
C. collection, recycling or reuse of wastewater and rain water
2. No one is allowed to perform the tasks defined in A, B, and C above unless this person is obeying the rules and conditions determined as indicated in this article.

Water Law[9]

The law gives the Water Authority the right to consider any area as a conservation area if this area poses a threat on the groundwater resources (Article 31). In addition, the Water Authority has the right to inspect any site that is suspected to cause water pollution. The law is based on polluter pays principle (Article 32).

Licensing

1) Environment Quality Authority
EQA[10] should issue a list of industries that EQA will issue a list of industries that will require an environmental approval prior to licensing and its renewal (ARTICLE 47-48). It is also not allowed for any official organization to issue a license or its renewal for an establishment or an industry that is listed in this official list without prior approval or EQA. However this list is not issued yet, therefore the type of industries that are referred to EQA to obtain approval are subjected to the Employees of the licensing official agencies. When licensing any industry or establishment, the environmental consideration should be taken into account minimization of the environmental damage from the industries' operation. Also priority should be given when licensing to environmental friendly industries (Article 46).

In addition to the above, EQA has published the Palestinian Environmental Impact Assessment Policy. This policy defines the activities subject to an Environmental Impact Assessment (EIA), basic principles underling the policy, responsibility for implementation, the reviewing committee for EIA, stakeholder consultation…etc. A list of activities and industries that requires an EIA is presented in this policy, these industries are subject to EIA and therefore to approval before establishment from the EQA.

2) Municipality (Local Authorities)

[8] Official gazette – Palestinian Facts – April 2005, Page 14-34
[9] Official gazette – Palestinian Facts , September 2002. page 5-28
[10] Official gazette – Palestinian Facts – February, 2000. page 38-70.

Based on the Law on Local authorities'[11] No. 1 for the year 1997, the municipality is responsible for issuing construction licensing according to proper public health standards. In addition, the municipality is responsible for organizing industries and workshops in the city, specify appropriate locations for different kinds of industries/workshops, and monitor the workshops and industries that impact health and create nuisance to the public. Also the municipality is responsible for solid waste collection and for monitoring that industries are disposing their waste according to the standards issued the Municipality. (Also the municipality is responsible for zoning of the city. Article 15.

3) Ministry of National Economics
Ministerial Cabinet Decree No. 10 (1999) regarding licensing of industries and industrial establishments[12].
Any industrial establishment requires a license and its renewal from the ministry of National economics. Also any industrial establishment that requires expansion should obtain the license from MNE (article 2).

Article 3B indicate that MNE can ask the owner of the industry to present information and obtain approval from other official organizations required by other laws issued in the country related to that type of industry.

4) Ministry of Health
The Ministry of Health is responsible for licensing factories / industries and workshops that 1) produce food and beverage products, 2) pharmaceutical industries, 3) chemical industries that produce make up and perfumes, and 4) solid waste collection and treatment facilities (Article 2) [13].

5) Water Authority
The Water authority is responsible for licensing industries that produce or treat water[14].

Industry characteristics

Response rate

The total Number of industries and workshops in Ramallah industrial zone is 355. A total of 320 industries were surveyed. The distributions of interviewed industries compared to municipality records by type are presented in Table 1. The fieldworkers visited all industries included in the municipality list with 100% coverage. However, 54 of these industries have either closed or moved (43 industries and workshops) or sell spare parts (6 workshops). It is important to mention that during 2006 the economic conditions of the OPT were difficult, given the intensification of conflict and other constraints. This resulted in the closing down of some institutions or a change in their location. The response rate for this study was a high 90.1% of all operating industries.

[11] Official gazette – Palestinian Facts , November 1997. page 5-34.
[12] Official gazette – Palestinian Facts , February 2000. page 103-108.
[13] Official gazette – Palestinian Facts – April 2005, Page 14-34.
[14] Official gazette – Palestinian Facts , September 2002. page 5-28

Table 1: Number of industries by type in Ramallah city based on the municipality records and the interviewed industries in this study

Type	Municipality records 2006	Interviewed industries	Non-response	Closed/ moved industries/sell only
Car Repair workshops	123	113	14	1
Chemicals and pharmaceuticals / Plastic and rubber/ textile	31	24	2	3
Construction/ stones and marble	16	17	6	15
Food/drinks and tobacco	16	15	2	3
Metal and engineering	98	74	7	17
Paper, cardboard and packing	5	12	0	7
Wood and furniture	74	59	0	2
Other	26	6	4	6
Total	389	320	35	54

Respondent's Education level

The interviewed persons at the industry were mainly either the owners or managers of the industry. In 10% of the industries, these two persons were not available and the interview was conducted with technical or administrative employees at these industries as indicated above. The education of the respondents indicated that 35% had a degree higher than that of secondary school, thirty one percent of the interviewed had basic education or less (i.e. maximum education 10th grade), and 34% had obtained High school certificate, i.e. finished secondary schooling (Figure 3).

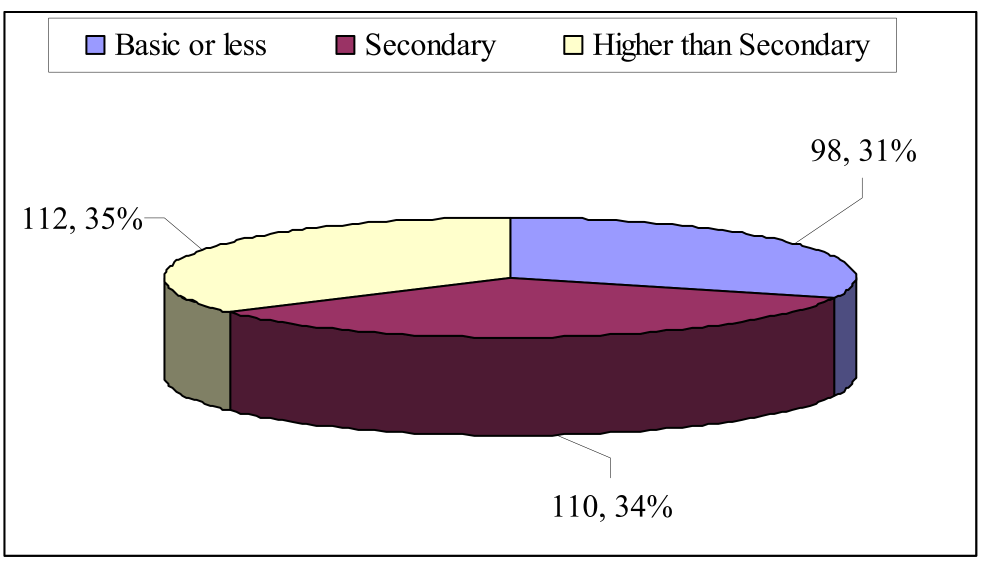

Figure 3: Respondent's academic Attainment

Respondent’s working experience in the industry

Fourteen percent of the respondents have been working for less than a year in the industry, 27% for a period ranging one to five year, 27% for a period six to ten years, and 31% for more than 11 years in the industry. The distribution of the interviewed industries by their length of work at their current job in the industry was very similar to that of years working at the industry. As 16% has been working in this position for less than a year, 31% has been working in this positions for duration between one and five years, 26% has been working at their current position for 26%, and 28% has been working at their current position for about 11 years.

The similarity in pattern between working in the current position and in the industry is explored in Figure 4. Most of the interviewed persons (90%) entered the industry in the current job, four percent of the interviewed persons in the industries, has obtained their new position within five years of entering the industry, another four percent got their current position within six to ten years, 2% has got their current job after ten years working in the industries. This indicate that those who interviewed, which are mainly owners or managers do not change their position, particularly the group we interviewed were mostly either owners or general managers, the highest positions in the industry.

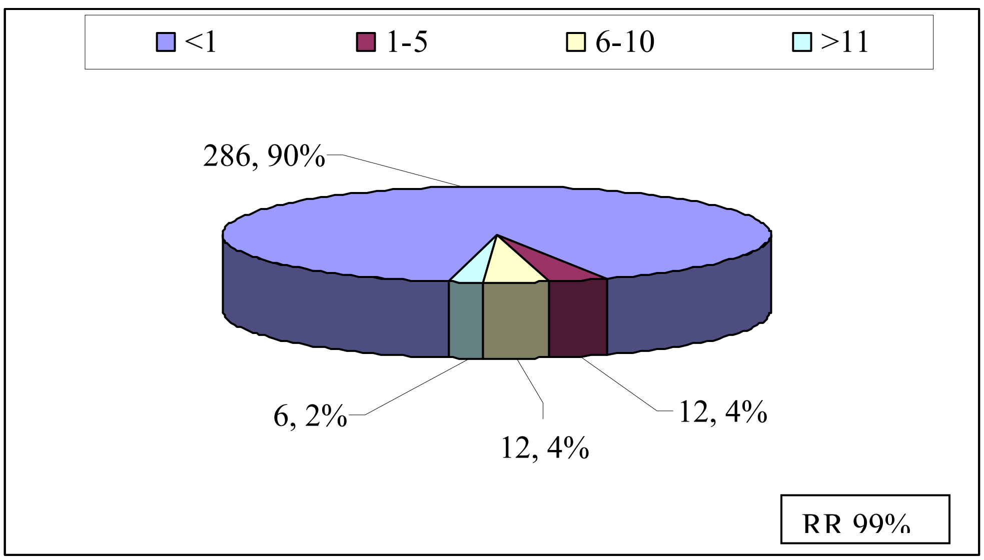

Figure 4: Difference between the years of entering the industry and obtaining the current position.

Distribution of industries by type

The distribution of industries by type is shown in Figure 5. More than one third of the industries / workshops in Ramallah city industrial and mixed zones were car repair workshops, followed by the metal and engineering workshops and industries at 23%, wood and furniture industries form about one fifth of the industries in this zone. Advanced industries such as chemicals, food industries are limited in the industrial zone of Ramallah, and their percentages among industries are 7.5 %and 4.5%, respectively.

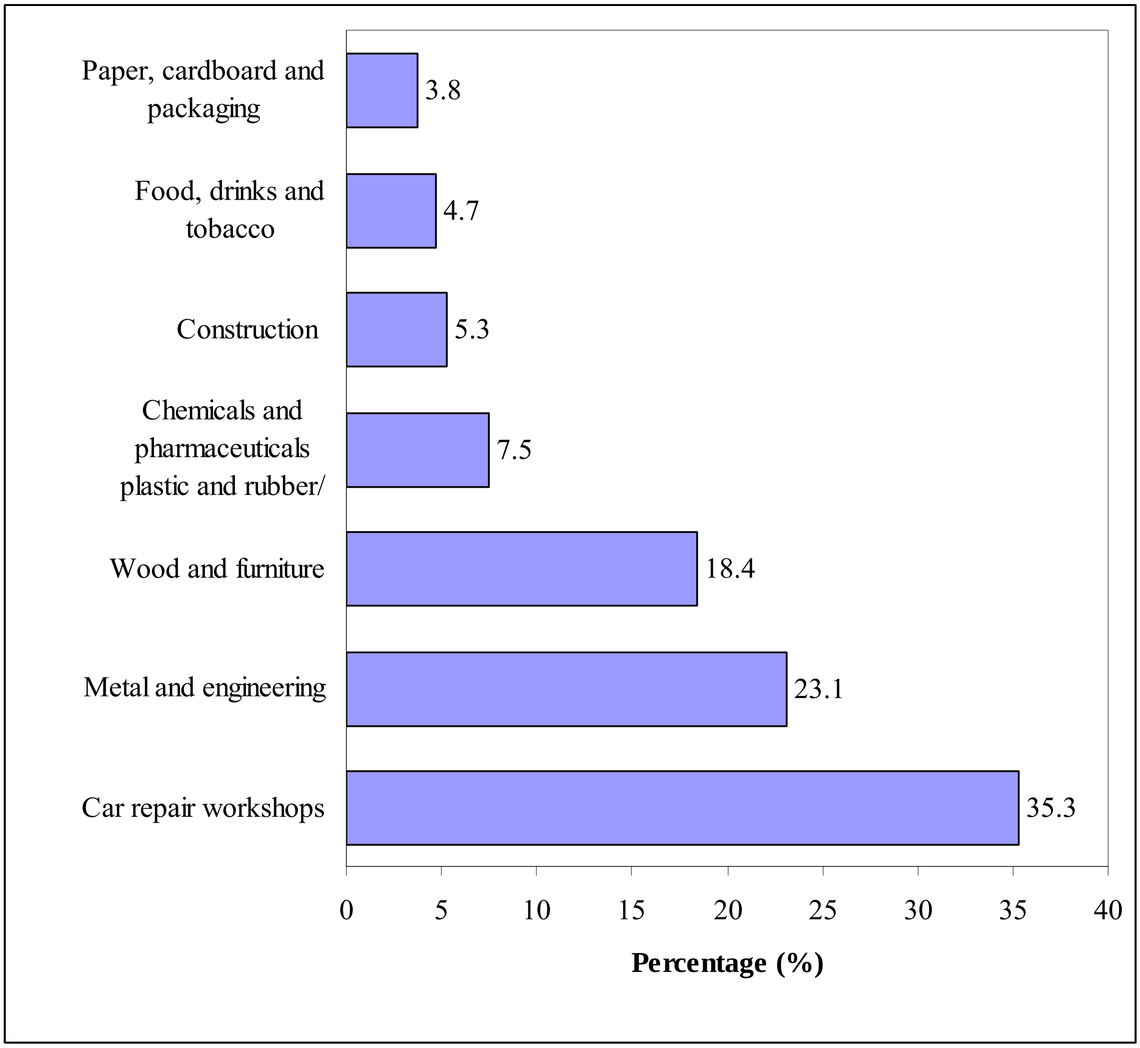

Figure 5: Distribution of visited industries in Ramallah city industrial zone by type

Licensing

First Licensing of the indstry

The number of industries/workshops that are illegal, i.e. never obtained a license is 65 (20%). Of the industries that have been licensed at least once in their operational history, 85% reported having licensed their industry for the first time after establishment [15] in the same year of establishment, 9% licensed their industries a year after establishment, and 6% licensed their industries after more than a year of establishment (Figure 6).

[15] Industries and workshops are supposed to license their industry for the first time at the time of its establishment, and this license should be renewed annually.

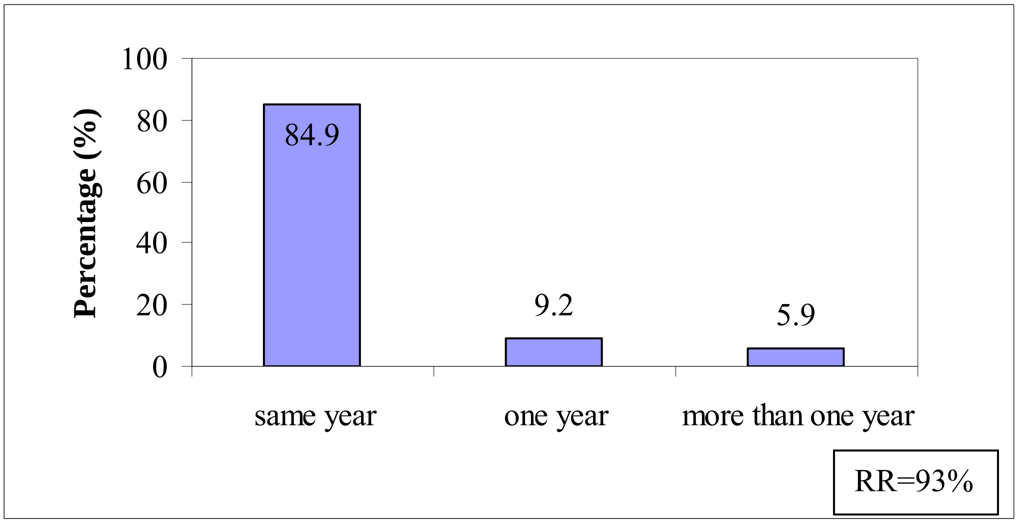

Figure 6: Difference between establishment of industries and their first licensing year.

Last licensing of the industry

Of the industries that have ever obtained licensed, 60% obtained their newest license in 2007 (current year), 18% obtained their last license in 2006 (previous year), and 21% of the industries obtained their license before 2006 (Response Rate 91%).

Reported perceptions of licensing body

The industries which were licensed at least once were asked about the institutions they have to go to in order to obtain a license. Industries and workshops license their facilities from more than one official organization, therefore we counted the number of industries/workshops that indicated that they license from each official organization. Ninety five percent of those industries think that they should obtain a license from the municipality, 59% from the civil defense, 40% from the Ministry of Health, 34% from the Ministry of National Economics, 20% from the Ministry of Transportation, 20% from the Ministry of Labor, 18% from the Ministry of Finance, 15% from the Chamber of commerce, 13% from the Environment Quality Authority, 8% from the governorates office, 4% from the car repair union, and 6% think they have to license from other institutions (Table 2).

Other institutions include the General Petroleum Cooperation, Ministry of Agriculture, Labor union, Water authority, Ministry of Information, Ministry of Culture, and Ministry of Planning. It is obvious that there is not a clear understanding among industries on who they should go to in order to be licensed. All industries indicated that they should obtain license from more than one institution.

Table 2: Perception of industries on the licensing granting institutions

Name of granting institution	Number of industries	%
Municipality	241	94.5
Civil defense	151	59.2
Ministry of Health	101	39.6
Ministry of National Economics	86	33.7
Ministry of Transportation	51	20.0
Ministry of Labor	50	19.6
Ministry of Finance	45	17.6
Chamber of commerce	37	14.5
Environment Quality Authority	32	12.5
Governorate	21	8.2
Union of car repair	11	4.3
Others	16	6.4

RR: 99%

Perception of license renewal bodies

It is rational to expect that, if an industry is supposed to obtain a permit from a certain institution to be operational, that these institutions will also be responsible for the renewal of this license. Respondents indicated that they have to go to the several institutions to renew their license, including, municipality, Civil defense, Ministry of National Economics, Ministry of Health, Ministry of transportation…etc. Table 3 presents each license renewal agency mentioned by the industries and the percentage of industries that indicated the need to renew from that agency.

Table 3: Perception of industries on the licensing renewal granting institutions

License renewal granting institution	Valid	%
Municipality	235	92.2
Civil defense	106	41.6
Ministry of National Economics	58	22.7
Ministry of Health	57	22.4
Ministry of transportation	51	20.0
Ministry of Finance	44	17.3
Ministry of Labor	29	11.4
Chamber of Commerce	25	9.8
Union of car repair	14	5.5
Governorate	11	4.3
Environment Quality Authority	9	3.5
Others	7	2.7

RR: 98%

It can be seen that the municipality is the main institution that is perceived as the primary agency for license renewal as 92% of the respondents believe they should renew their license from it. The second institution is the civil defense at 42%. At the third level the ministry of national economics, the Ministry of Health, and the Ministry of transportation are seen to renew license, as 20-23% of the industries believe that they should renew their license from these industries.

Our results indicate that the majority recognize that licenses should be obtained for initial operation. However, renewal is not seen as a requirement, as 72% of the respondents who obtained an initial license from the EQA think they should not renew their license from them as a requirement for operation. Likewise in the range of 32% to 48% of the respondents who obtained their license from the governorate, Ministry of Labor (MOL), Ministry of Health (MOH), chamber of commerce, MNE, Civil defense think that they should not renew their license from these institutions. Only 5% of the respondents think that they should not renew their license from the municipality, and 10-12% thinks that they only license without renewal from Ministry of Transport (MOT), Ministry of Finance (MOF), and the union of car repairs.

Table 4: Percentage of institutions that they think they should obtain a license from, however do not think they should renew their license from

	licensed without renewal
Municipality	4.9
Ministry of transportation	10.5
Ministry of Finance	12
Union of car repair	12.5
Civil defense	32.1
Ministry of National Economics	33.3
Chamber of Commerce	39
Ministry of Health	44.1
Ministry of Labor	44.2
Governorate	47.6
Environment Quality Authority	71.9

Actual license obtained at the industry

Industries which have been licensed at least once were asked if they are licensed from the institutions they are supposed to license from. Two hundred and three industries (81%) indicated that they are licensed from all institutions they are supposed to license from, forty eight industries (19%) indicated that they are not licensed from all institutions they are supposed to license from, and one industry respondent did not know if they are (Figure 7).

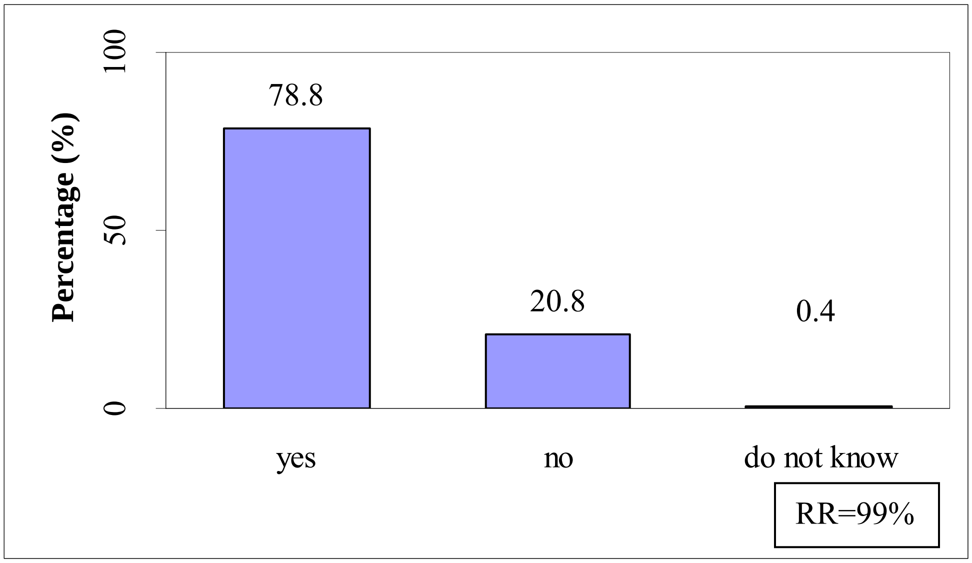

Figure 7: Industries' response to: are you licensed from all institutions you are supposed to license from

Industries do not license from one institution, the count of industries that indicated that they are licensed from different institutions is presented in Table 5. Industries license mainly from the municipality (88%), as well from the Civil defense (50%). Both institutions are service providing institutions for industries. This is explained in the roles of institutions section in details.

Table 5: Institutions from which the industries obtained license

	Valid	%
Municipality	224	87.8
Civil defense	127	49.8
Ministry of Health	83	32.5
Ministry of National Economics	72	28.2
Ministry of transportation	48	18.8
Ministry of Finance	45	17.6
Ministry of Labor	40	15.7
Chamber of Commerce	36	14.1
Environment Quality Authority	26	10.2
Governorate	18	7.1
Union of car repair	10	3.9
Others	14	5.5

RR: 96.5%

The industries were asked about both advantages and disadvantages of licensing. Sixty three industries (17%) indicated that there are not any positive aspects related to licensing, and one hundred and fifty industries (47%) indicated that there are no negative aspects of licensing, or disadvantages. Of those who answered that there are positive aspects or advantages of licensing, 35% indicated that it provides a legal status, 15% mentioned that licensing facilitate work with official organization, 13% indicated that licensing protects the industry workers', 12% it improve marketing, 11% it gives personal satisfaction, 8% it provides benefits and services, 6.7% indicated that it facilitates the work with other industries, 5% indicated that it financial savings to be licensed, and 3% did not know the advantage of licensing (Table 6).

Table 6: Advantages of licensing

	Valid	%
Licensing provides legal status	139	35.1
Licensing facilitate work with official organizations	56	15.4
Licensing protects industry workers	39	12.9
Licensing improve marketing	38	11.9
Licensing provides personal satisfaction	33	10.5
Licensing provides benefits and services	28	8.2
Licensing facilitate work with other industries	13	6.7
Financial issues related to licensing	15	5.0
Do no know what advantage of licensing	8	2.7

RR: 98.4%

The main disadvantage of licensing is that it is expensive (37%), the second disadvantage the industries see as disadvantage that licensing does not guarantee any right or sufficient services (9%), the third disadvantage was the bureaucratic procedures of licensing (4%), 3% of the industries indicated that laws are not implemented equally on all industries, therefore licensed industries become disadvantaged, and 2% indicated that they are harassed legally as the official institutions know that these industries exist and not licensed, 3% indicated that they do not know the disadvantages of licensing (Table 7).

Table 7: Negative aspects of licensing

	Valid	%
Licensing is expensive	118	36.9
Licensing does not guarantee any rights or no enough services	29	8.5
Licensing is bureaucratic	13	4.0
Do not know what are the negatives of licensing	8	2.7
Law is not implemented equally on everyone, creates disadvantage for licensed	8	2.5
Being followed and harassed because they know we exist	7	2.2

RR: 98.1%

Inspection

The industries were asked about the inspection agencies, the frequency of inspection and type of inspection conducted by these agencies. Interestingly 37% industries (118) are not being inspections, 42% are inspected by the municipality, 28% by the civil defense, 18% by the MOH, 8% by the MOL, 6% by MNE, 2% by a committee composed of more than one institution, 2% by EQA, and 8% are inspected by other organizations or institutions.

Table 8: Inspection agencies

	Valid	%
No inspection	118	37.2
Municipality	135	42.2
Civil defense	88	27.5
Ministry of Health	58	18.1
Ministry of Labor	26	8.1
Ministry of National Economics	18	5.6
Committee from different institutions	7	2.2
Environment Quality Authority	6	1.9
Other, such as: governorate, Ministry of Planning, MOT, MOF, Police, Insurance companies, Ministry of Agriculture, Palestinian Standard Institution (PSI), Car repair union, Private companies	24	7.5

RR: 99.1%.

The frequency of inspection of industries was mainly once per year (59%), 21% of the industries are inspected twice per year, 19% are inspected more than three times per year, and 1% are inspected less than once per year (RR =92.6%).

The inspection was targeting the following issues, 55% of the inspection is related to occupational health and safety, 55% related to licensing, rent and fees, 20% is related to health and environmental issues, 8% are inspected for more than aspect, 5% are inspected for quality control, and 4% are inspected with regards to disturbance of neighbors, streets, area (Table 9).

Table 9: Type of inspection

	Number	Percentage (%)
Occupational health and safety	110	54.5
License rent and fees	110	54.5
Health and environment	41	20.3
More than one type	17	8.4
Quality control	11	5.4
Municipal, street, area, impact on	8	4.0

neighborhood

RR 97.5%

Knowledge of laws and their implementation

Industries were asked about their knowledge of water law, environmental law, public health law and labor law, how do these laws affect their operations, implementation and knowledge of sanctions imposed by the law in case of violation.

Knowledge of laws and their implementation – Water Law

Out of the 320 industries only three knew something about the water law, and one indicated that they have heard about it but do not know its details. Of those industries, two answered the questions about the main points that the water law covers and the first one indicated that this law has nothing to do with industry, and the second industry indicated that the water law covers issues related to water recycling and reuse. The third industry which indicated that knew the law, could not answer anything regarding the main points that the law covers. When the industries who knew the law were asked how the law affects their industry the following answers were obtained: 1) this law does not affect my industry; 2) it is too costly to implement; and 3) the law promotes water recycling and reuse at the industry. When these three industries were asked if they implement this law, all of them said yes. They also indicated that they do not know of any penalties imposed on violations of the law.

Knowledge of laws and their implementation – Environmental Law

Results indicate that main problems facing the implementation of the law are the lack of knowledge of the existing law and its specifications. Only 4 industries indicated that they knew that the environmental law exists, and 7 indicated that they have heard about it, although did not know its specific details. Those two industries that knew about the law and did not implement it were never exposed to any violations. This indicates that there is a weak inspection and enforcement authority. In order to be able to enforce a law, it is important to understand how industries would respond to any enforcement incentives [27]. The seven industrial owners and managers who knew anything about the industrial law indicated that the law: "explains the standards and regulations related to environmental issues" or that it has to do with environmental protection, and that it is related to air. When industries were asked how this law affects the industrial practice few were able to answer this question and the following answers were given: 1) the operation of the industry will be in an environmental friendly manner 2) it is expensive, 3) it bans burning of chemical. Two industries indicated that the law does not affect the industrial operations at all. It is worth mentioning that the industry that indicated that the law will affect operations of industries is the only industry that had obtained ISO14001 certificate.

Knowledge of laws and their implementation – Public Health Law

The number of industries who knew the public health law was 15 industries (4.7%), additional 9 (2.8%) industries said that they heard about the law but do not know its details. Fifteen industries indicated that the law deals with occupational health and safety, 3 industries indicated that it deals with public relations regarding cleanliness and disturbance, and 2 industries indicated that it has to do with product safety for human consumption. Of the industries who knew the law, 5 indicated that it improves the operations within the industry, 6 indicated that it positively impact the industry but without any specifications, and 5 said that it does not impact the industry.

Knowledge of laws and their implementation – Labor Law

Results indicate that only 23 (7%) of the industries knew about the Labor law. Further questions were asked to measure the knowledge of selected item within labor law addressing work conditions.

Most of these twenty three industries knew law items related to internal sanitation, number of toilets and bathrooms, providing eating places, changing rooms, regulation regarding bad lighting, noise and bad ventilation (Figure 8). Almost half of the industries know law regulations regarding, using, moving, storing, and disposing chemical materials. It is interesting to know that industries owners/ directors are only aware of labor law items that dealing with money such salaries, holidays, and working hours.

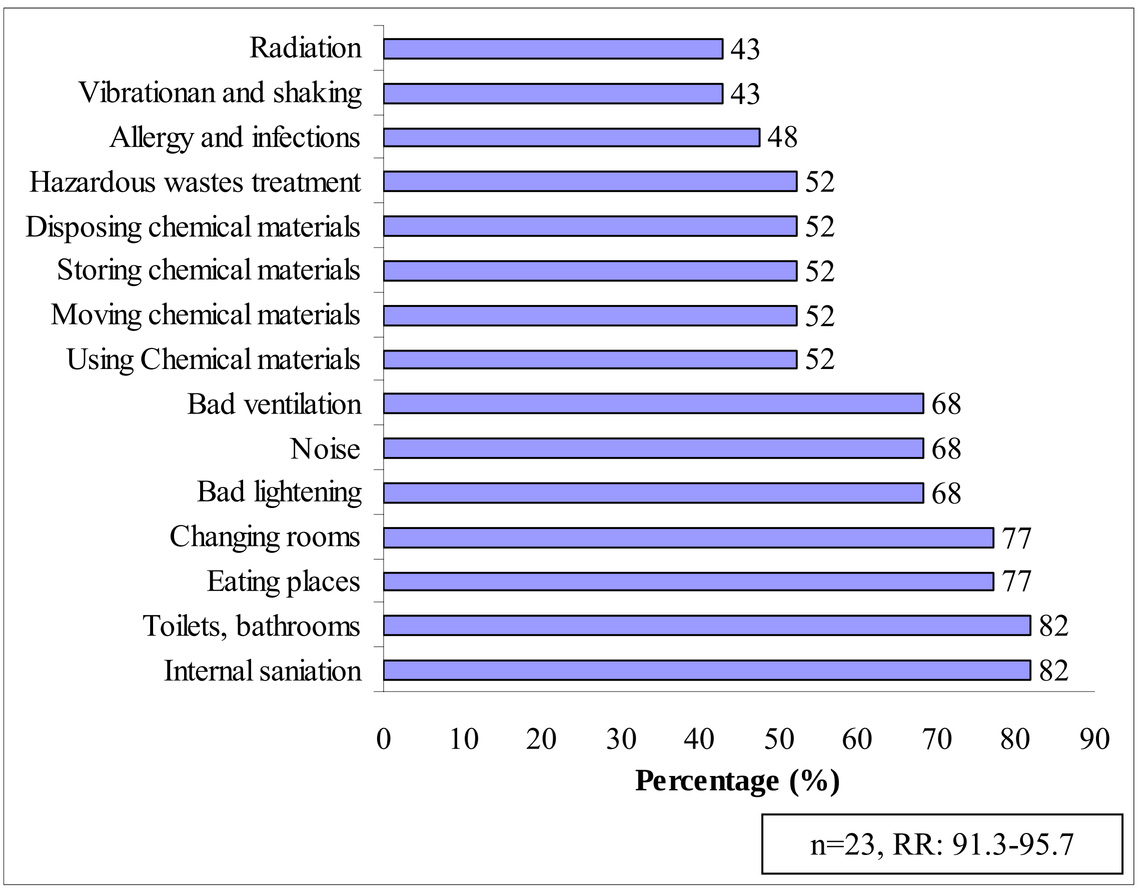

Figure 8: Knowledge of specific items in the Labor Law

When owners were asked about their knowledge regarding safety measures list (cabinet verdict no.49, 2004). Eleven percent (35 industries) of all industries knew about it and 89% (274 industries) didn't have an idea what it was.

Obstacles facing or preventing laws implementation

When industries were asked about the obstacles facing the law, 21% indicated that there are not any, 19% did not know what prevents laws implementation, 13% said that the lack of commitment and experience of the official authorities is hindering law implementation, 10% said that financial obstacles are the main obstacles facing laws implementation, 5% said that lack of infrastructure and services hinders laws implementation, and 3% indicated that law implementation is hindered by lack of commitment from the industries or employees and due to personal reasons (Table 10).

Table 10: Obstacles facing laws implementation

	N	%
No obstacles facing laws	66	20.6
Do not know what is preventing law implementation	60	18.8
Lack of authority commitment experience equality is obstacle Facing law implementation	43	13.4
Financial obstacles facing law implementation	31	9.7
Lack of infrastructure or services prevent law implementation	15	4.7
Personal reasons and lack of commitment by industries and employees preventing law implementation	10	3.1

RR: 66.9%

Factors that will motivate law implementation

The most important factors reported that motivate industries to implement the law were related to the need for a better understanding of these laws by both the industries and inspectors, facilitation of licensing procedure, and the need to provide clear mechanisms to implement these laws, as well as the need to establish by laws explaining and supporting the laws (Table 11). On the other hand, EQA official indicated that the main problems facing the implementation of the laws is the lack of by laws, and the poor enforcement mechanism, as the enforcement mechanism requires both political and financial stability which is not present, in addition to the inability to control resources and trans-boundary issues such as lack of control on environmental pollution from Israeli Sources[16].

[16] Interview with Dr. Khalid Qahman, Assistant Chairman – EQA. 2007.

Table 11: Motivation for law implementation as seen by industries (%)

	% Important	% Average	% Not important
Increase awareness among inspectors	89.0	7.6	3.5
Awareness about laws by industry sector	88.3	8.2	3.5
Facilitating licensing procedure	86.1	8.9	5.1
Providing mechanisms for implementing the laws	83.9	9.9	6.3
Establish bylaws to explain the laws	77.6	16.3	6.1
Having executive power to implement law	68.7	10.0	21.3
Importance of/ financial motivations in implementing the law	68.4	13.3	18.4
Using implementation of such laws as a marketing strategy	67.9	17.8	14.3
Financial penalties	59.4	15.2	25.4
Threats to withdraw the license, closing the industry	50.8	20.8	28.4
Threats of bad reputation	46.0	13.0	41.0

RR: 95-99%

Membership in trade and industrial organizations

The industries were asked if they are members in the three most important organizations concerned with trade and industrial development. Sixty four percent of the industries are members of the Chamber of Commerce and Industry, 16% are members of the Palestinian Federation for in industry, and 6% are members of PalTrade (Figure 9).

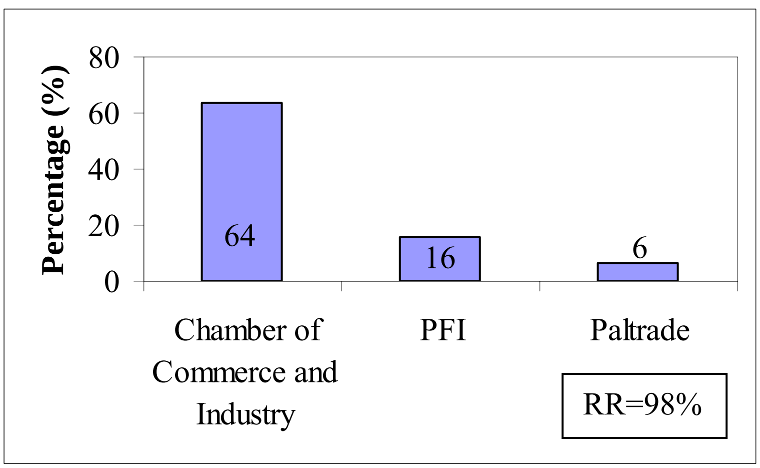

Figure 9: Membership in trade and industrial organizations

Training and technical support to industries

Eighty six percent of industries do not obtain any technical support and training, and only 46 industries receive training and technical support. Of those who receive training the providers are the chamber of commerce and industry, official governmental organizations and unions, non governmental organizations (NGOs) and private sector, PFI, and Paltrade (Table 12).

Table 12: Institutions that provide training and technical support

	Valid	%
Chamber of Commerce and industry	22	47.8
Official governmental and unions	13	28.3
NGOs and private sector	10	21.7
PFI	7	15.2
Paltrade	4	8.7

RR: 99.1%

The frequency of training as indicated by those industries is variable, 35% of the industries receiving training with a frequency less than once per year, 15% receive training twice per year, and 24% of industries that obtain training received more than twice per year (RR =67%).
The training / technical support provided to those industries includes issues, such as: increasing the awareness about industry, exhibitions, training on administrative issue, vocational and technical training, and occupation health and safety training (Table 13).

Table 13: Type of technical support and training

	Valid	%
Increase awareness about industry and general training issues (not specified), visit exhibition, how to obtain permits	22	47.8
Training in administration issues	14	30.4
Training in vocational and technical issues	10	21.7
Training on occupational health and safety	2	4.3

RR 89%

Role of institutions

The industries were asked about their perception regarding the roles of the following institutions: Paltrade, PFI, Chamber of Commerce and Industry, MNE, MOH, Municipality, EQA, Civil defense, MOL, Labor unions, and PSI.

Role of industrial Support institutions

The main roles of the chamber of commerce and industry, PFI and Paltrade include facilitation of marketing, technical support, support and encouragement of local industries, and financial support. In general industries indicated that these are mainly support institutions to the industries. Although the type of support is similar among these organizations as indicated by the industries, mostly the industries were able to identify the role of the Chamber of commerce and industry better than PFI or Paltrade.

About one forth of the industries and workshops did not know the role of the chamber of commerce and industry, and about three fourth of the industries did not know the roles paltrade and PFI. Also almost all industries knew the chamber of commerce and industry, while 9% did not PFI, and 21% did not know Paltrade. IN general, the chamber of commerce is seen the main institutions that facilitates marketing with more than half of the industries (173 industries and workshops) think that it is their role (Table 14).

Table 14: Role of Chamber of Commerce and Industry, PFI, and Paltrade

	Chamber of Commerce and Industry		PFI		Paltrade	
	No.	Percent	No.	Percent	No.	Percent
Facilitate marketing	173	54.1	9	3	37	11.6
Technical support	26	8.1	19	6.2	9	2.8
Support and encourage local industries			18	5.9		
Financial support					1	0.3
Other roles	21	6.6	7	2.3		
No role	16	5	5	1.6	2	0.6
Do not know its role	86	26.9	221	72.5	194	60.6
Do not know the institutions	5	1.6	26	8.5	67	20.9
Response Rate	RR: 97.2%		RR: 95.3%		RR: 97.2%	

The palestinian Standard institusion is a governmental instituion, however the standards issued by it are not binding by the law. These standards are voluntarily and ususally industries attempt to obtain certificates from PSI to improve the marketing locally and intenarationally. In some occuasions, governmental bodies might issue a bylaw that will make a particular PSI standard binding by law. The industries see that the major role of PSI is quality control, drafting standards and issuing certificates (Table 15). Some industries think that PSI should have a legal role, this legal role is actually related to monitoring and inspection that the standards are beeing implemented, some indicated that it should have the power to issue fines and closure of the indutry as well. It was observed that about quarter of the industries/workshops did not know PSI, and about 38% did not know its role.

Roles of other National Governmental organizations

The governmetnal organizations roles include Ministry of Health, Environment Quality Authority and Ministry of National Econmics. The Role of Minsitry of Labor will be discussed in labor organizations section. In general tecnical assistance is seen to be the least important role among these governmental agenices. Only 5 % see it as a role for MNE, 9% as part of the roles of MOH, however it was not indicated as a role for EQA.

The Role of the Ministry of National economics was mainly seen to support and encourage local industry, coordinate tthe work of industry, encourage and facilitate interantional trade, control of export and import. In addition the industries believe that the Minsitry of National Economics have a legal role, including licensing supervision, monitoring (Table 16). About quarter of the industries did not know the Ministry of National Economics, 7% did not know the institution, while 5% said that it has no role at all.

Table 15: Role of Palestinian Standard Institution

	Valid	%
Quality control	71	22.2
Draft standards	24	7.5
Issue certificate	20	6.3
Legal action, such as closure, fines	20	6.3
Other role such as technical support, facilitate paper work for production, support local industries, etc	17	5.3
No role	19	5.9
Do not know the institution	78	24.4
Do not know its role	120	37.5

RR: 96.9%

Table 16: Role of Ministry of National Economics

	Valid	%
To encourage and protect local industries, facilitate procedures, coordinate work between industries, solve problems related to industries	110	34.4
Encourage and facilitate international business, export, import, and monitoring of import	73	22.8
Licensing, supervision, monitoring, and implementation of law including fines closure	59	18.4
Other roles	57	17.8
Technical assistance	17	5.3
No role	14	4.4
Do not know the institution	21	6.6
Do not know its role	82	25.6

RR: 97.8%

The Environment Qualtiy Authrooity was the least known organization among the governmetnal agencies, 28% did not know that EQA exist, 40% did not know its role, and 7% indicated thate it has no role (Table 17). The roles of EQA can be divided into two major roles: 1) Environmental protecition and pollution control (14%), and 2) legal role including drafting laws, licensing, inspection and law enforcement (14.%).

Table 17: Role of Environment Quality Authority

	Valid	%
Environmental protection and pollution control	44	13.8
Legal, licensing inspection, law implementation, drafting	45	14.1
Other roles	21	6.6
Do not know the institution	89	27.8
Do not know its role	126	39.4
No role	21	6.6

RR: 97.8%

The roles of the Ministry fo Heatlh is mainly seen as a legal role. This can be divided into 1) occupation health and safety inspection (30%), licensing, finese, laws, inspection (26%), and health inspection, health certificates and quality control (23%). Other roles were also seen as part of the MOH role such as public health protection, medical services, medical insurance, awareness.

Table 18: Role of Ministry of Health

	Valid	%
Occupational health and safety inspection	96	30.0
Legal role such as licensing, fines, inspection, draft laws	83	25.9
Health inspection, certificate, quality control	74	23.1
Public health protection including insurance and medical services	55	17.2
Technical assistance and awareness	30	9.4
Other roles	38	11.9
No role	22	6.9
Do not have opinion its role	2	0.6
Do not know its role	44	13.8

RR: 97.8%

Role labor related institutions

The roles of the labor union and the ministry of labor are seen by the industrial owners very similar. Even one industry indicated that the labor union is part of the Ministry of Labor Nevertheless the Minsitry of Labor is the regulatory governmental body, while the labor union is a union in which workers can be members that aims at supporting workers. Both are seen to have their major role in supporting and protecting the workers in the industrial sector, although the labor union is seen to be stronger in that presepective than the ministry of labor, as 65% of the industrial owners indicated that the main role of labor unions is supporting and protecitng workerrs, while 30% indicated that this role is for the ministry of labor. Creation of jobs also seen as dual task for both the union and ministry. Seven percent of the industries/workshops see that creation of jobs is part of the labor union role, and 15% see that it is part of the Minsitry of labor role. Solving problems between workers and the industry and organize the relationship, as well as technical assisstance and awareness are seen roles for both organizations. Supporting small workshops and their owners is seen as a role for the labor union, this is because theese owners see themsevles as sef employed and expect the union to support them. The Labor union is seen also responsible for inspection on the workers and collecting participation fees, and seen to have a role in labor price control in the market by setting minimal wage, as well as follow up on issues such as insurance. On the other hand, the Ministry of labor is seen the regulatory agency that drafts laws and conducts inspection to ensure proper implementation of these laws is taking place (Table 19).

Table 19: Role of Labor Union and Ministry of Labor

	Labor Union		Ministry of Labor	
	N	%	N	%
Support and protect workers	208	65	93	29.1
Creation of jobs	23	7.2	49	15.3
Solve problems between workers and employers / Organize relationship between worker and industry	19	5.9	32	10
Other roles such as technical support and awareness, permits	21	6.6	44	13.8
Support small workshops and their owners	18	5.6		
Inspection, fees collection, labor price control, follow up jobs, insurance	33	10.3		
Legal, inspection, draft laws, fines			71	22.2
No role	14	4.4	29	9.1
Do not know the institution	6	1.9	6	1.9
Do not know its role	56	17.5	107	33.4
	RR: 96.9%		RR: 97.5%	

Role of Local government and Civil Defense

The municipality and civil defense are well known to industries, because of the services they provide. About two thirds of the industries see the municipality role as a legal one that includes is licensing, inspection, laws enforcement (59%). The second role that is seen as important is service provision. The municipality provides solid waste collection, street cleaning, wastewater collection and treatment, as well as street lightning and pavement. The third role for the municipality is seen zoning, and provision of proper industrial zones (Table 20).

Table 20: Role of Municipality

	Valid	%
Licensing, inspection, law implementation, fines	190	59
Service provision	179	56
Zoning and provision of proper industrial zones is roles for municipality	55	17
Other roles	40	13
No role	14	4
Do not know the institution	17	5
Do not know its role	16	5

RR: 96.9%

The civil defense major role is seen to act in emergency and provide public safety services, such as fire protection (Table 21). The second important role seen is a legal role, include drafting safety laws, inspection on safety measures, and imposing fines in case these measures are not implemented. The third role is seen in the technical assistance and awareness regarding safety issue (11%).

Table 21: Role of Civil defense

	Valid	%
Emergency actions and public safety services	186	58.1
Legal, inspection, draft laws, fines	171	53.4
Technical assistance and awareness	34	10.6
No role	11	3.4
Do not know the institution	1	0.3
Do not know its role	19	5.9

RR: 97.8%

Types of wastes generated and their disposal or treatment methods

Methods of solid waste management identified in this study include the following: recycling; disposal in backyard or front yard; disposal in municipal solid waste (MSW) containers that eventually end up in the non-sanitary dumpsite of Ramallah city; direct disposal at the random dumpsite; burning on-site; and re-use. The motives for these varied means of solid waste handling are mainly market driven. For example almost all metal scraps are sold by the industries. The little that is not sold is collected by the informal sector from the solid waste containers. Although plastic is the main waste product from packaging and the plastic industries, only about half of these industries recycle their plastic waste in house. One beverage industry, gives all their plastic for recycling for free in order to obtain a certificate of good disposal practice. This certificate is good for marketing their products abroad.

The waste from wood industries is mainly recycled in winter. Wood chips are used either by the industry or its neighbors for heating, or sold to bakeries. In summer, the amount of wood recycled is much less than in winter, because of no need for heating, and lack of storage spaces. Therefore industries dispose of such waste with the MSW instead. Sawdust is sold to poultry farms, and occasionally to animal farms. This has been a traditional practice in the poultry farms in the country. Stones, marble, gravel, and debris produced from the stone, marble industry is reused in construction and as a cover soil at the disposal site. The sludge from these operations is disposed of either at the site or with the MSW containers. Finally, paper is not recycled except in some larger scale printing shops. The paper is given to recycling industries outside the OPT.

Although solid waste handling is conducted as described above, hazardous solid waste on the other hand is disposed of either in the front/back yard of industries, or in the MSW containers. The lack of any recycling of hazardous waste is explained partially by the lack of regulations and implementation of regulations regarding hazardous waste and the underestimation of the value of produced waste. As a result of this, it is cheap (free) to dispose the hazardous waste in the solid waste container rather than recycling it. It is worth motioning that the fees for solid waste collection imposed by the municipality is not related to the amount or type of waste produced; rather it is related to the size (land area) of the factory.

Incorporating cleaner technologies or better environmental practices including those for solid and hazardous solid waste management can be hindered by several factors. In Zambia it was shown that cleaner technology implementation was hindered by financial limitations, poor enforcement of environmental law, the lack of knowledge and awareness, and lack of technical competence [28]. The current practices observed in Ramallah industrial zones pertain to reasons similar to those identified for Zambia.

Car repair workshops produce mainly used oils that are contaminated with heavy metals. The oil is either disposed off in the backyard, or sold for bakeries. This practice is very dangerous on the environment and public health and has to be addressed immediately by official bodies.

General Description of Workers and employee in the Ramallah industrial zone

Industries visited in Ramallah industrial zoon are of a small size, as they mainly employ less than 10 workers per industry. Almost 80% of all industries employ one and up to nine employees and only 20% employ ten or more employees (Figure 10). Most of large industries are food, chemical and pharmaceutical industries. It was thought that most industries in the West Bank are family based, however, our results indicates that 84% of industries are not family based industries, and only 16% are either owned by one person or are family based industries.

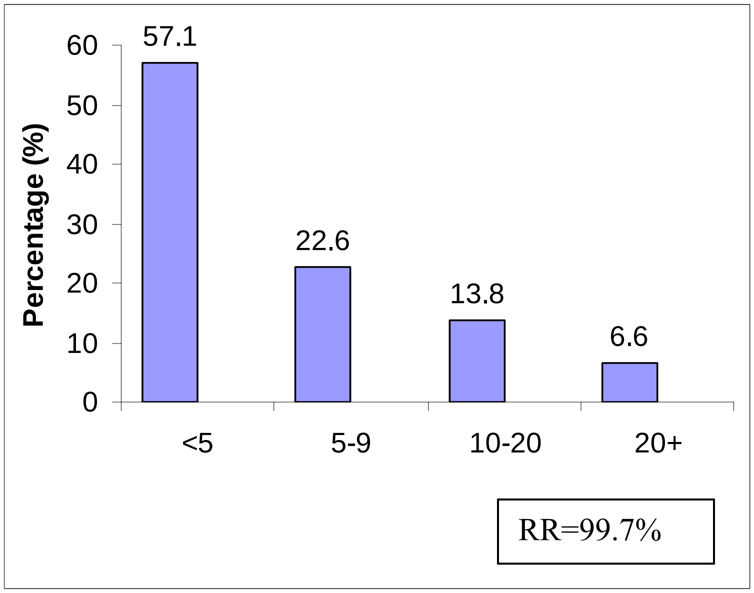

Figure 10: Industry size based on the number of workers

Employees were grouped into three categories: Administrative staff includes directors, general directors, executive directors, secretaries, accountants etc. Technical include individuals involved in the production line, machines, packaging, engineers etc. Non-technical individual working in the industry but are not involved in the production process such as cleaners, drivers, security guards etc. Table 22 provides summary of the mean, median, maximum and total number of staff working in the visited industries after excluding small workshops with only one worker who is at the same time the owner of the workshop. On average, visited industries have two administrative staff, four technical and three non-technical staff. Some industries have up to 76 administrative staff, 150 technical and 120 non-technical staff.

Table 22: Number of employees working in Ramallah industrial zone by work type

	Mean	Median	Maximum	Total
Administrative				
TOTAL	2.28	1.0	76	660
Male	2.07	1.0	63	600
Female	.21	0	13	60
Technical				
TOTAL	3.65	2.0	150	1059
Male	3.56	2.0	130	1032
Female	.09	0	20	27
Non-technical				
TOTAL	2.96	0	120	858
Male	2.68	0	100	781
Female	.27	0	40	77

Response rate=99.7%

A total of 164 female were working at Ramallah industrial zone at the time of the survey. Interestingly, 47% were working as non-technical staff and 37% were working as administrative staff and only 16% were technical staff (Figure 11). On the other hand, 43% of men were working as technical staff, 32% were working as non-technical and only 25% were administrative staff. Apparently, women are not yet accept as technical employee. They are either working as administrative, and these are mainly educated women, or non-technical, and these are mainly women from low socioeconomic status.

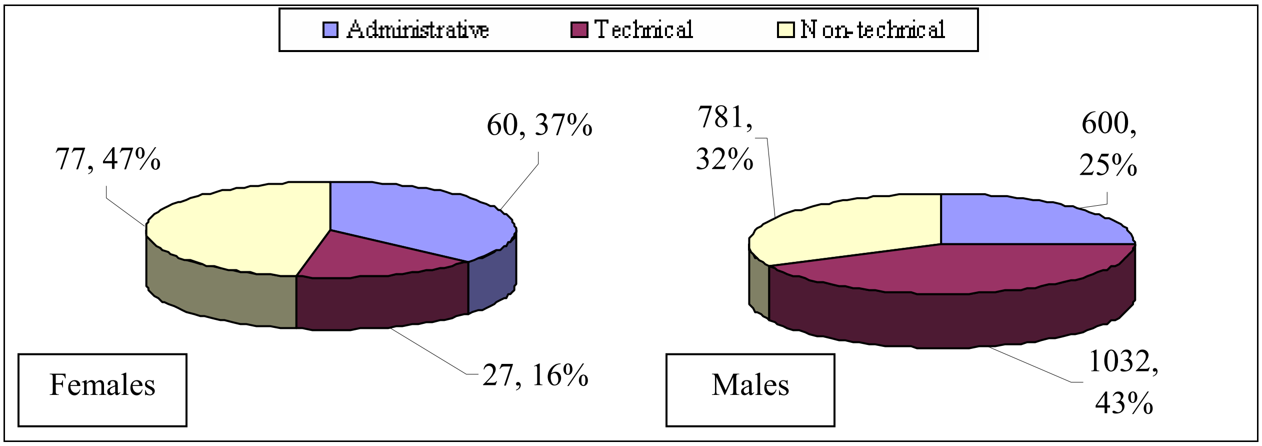

Figure 11: Distribution of type of employment by sex

The owners/directors of industries at Ramallah industrial zone were asked about the mean age, youngest and oldest ages of staff working at their institutions. Most employees were between 25 and 39 years old. It was difficult for the director / owner to estimate the mean age of employees and that explains the low response rate (42%). However, their answers regarding the age of the youngest and oldest was more accurate and the response rate was very high. Out of the youngest, four (1.3%) were 15 years old or younger. According to labor law, owners should not allow adolescent 15 years or less to work. The percentage is very low, but we should keep in mind that this is the formal sector and the reported percentage in this survey does not give any indication about child labor in the informal sector. Further these four adolescents might be relatives to the owner of industry and the norm in Palestine is to have the kids working (helping) in the family business. It is difficult to compare with Palestinian Central Bureau of Statistics (PCBS) reports because these ages were estimated by the owners while PCBS based the report on workers reporting their ages. According to PCBS, only 3.1% were between 15-17 years, 3.8% were in the West Bank [29].

Table 23: Distribution of workers ages for the oldest and youngest employee

	Oldest		Youngest	
	N	%	N	%
<15			4	1.3
16-18	1	0.3	68	21.3
19-65	292	91.3	213	66.6
65+	26	8.1	4	1.3
Response rate=99.7%			Response rate=90.3%	

It's interesting to note that in one of the industries the oldest is 18 years old and in 26 (8%) industries the oldest were 65 years old and above (Table 23). In other words, people start working at very young age and continuo to work up to older ages.
The majority of employees, administrative, technical and non-technical staff work 8 hours. Administrative and non-technical staff appears to work for longer hours compared to technical staff (Figure 12).

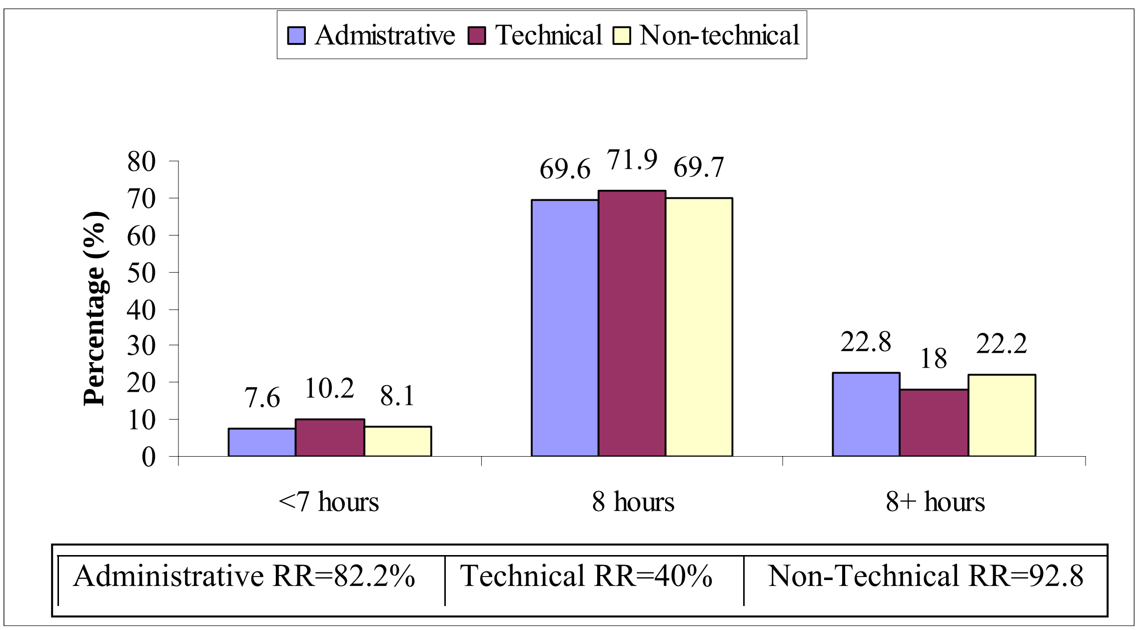

Figure 12: Working hours for industries employee by type of work

Industries owners were asked about the average wages of their employees. Administrative staff had the highest wages with a median of 3000 NIS, then the technical with 2000NIS and non-technical with 1500NIS (Table 24). The response rate for mean wages for administrative and non-technical staff was low as expected because administrative staff are over paid and non-technical are underpaid compared to technical staff. To have a better estimate of employee wages, the owners were asked about the minimum and maximum wages they pay. The wages ranged between 200-25000NIS.

Table 24: Average wages in new Israeli shekel by type of employment

	Mean	Median	Minimum	Maximum	Response rate
Administrative	3121	3000	420	13500	51.0%
Technical	2216	2000	650	8001	76.5%
Non-technical	1489	1500	400	4000	40.7%

Figure 13 presents the percentage that provide contract by the type of employment. The question of whether the industry provides contracts was not asked to workshops with one employee and to those working within the family business. Less than 50% of the industries provide contract to their employees, almost half provide contract for the non-technical staff and 58% provide contract to the technical staff. On average, working hours for workers in Ramallah industrial zone is similar to that reported by PCBS which was 42.2 hours per week.

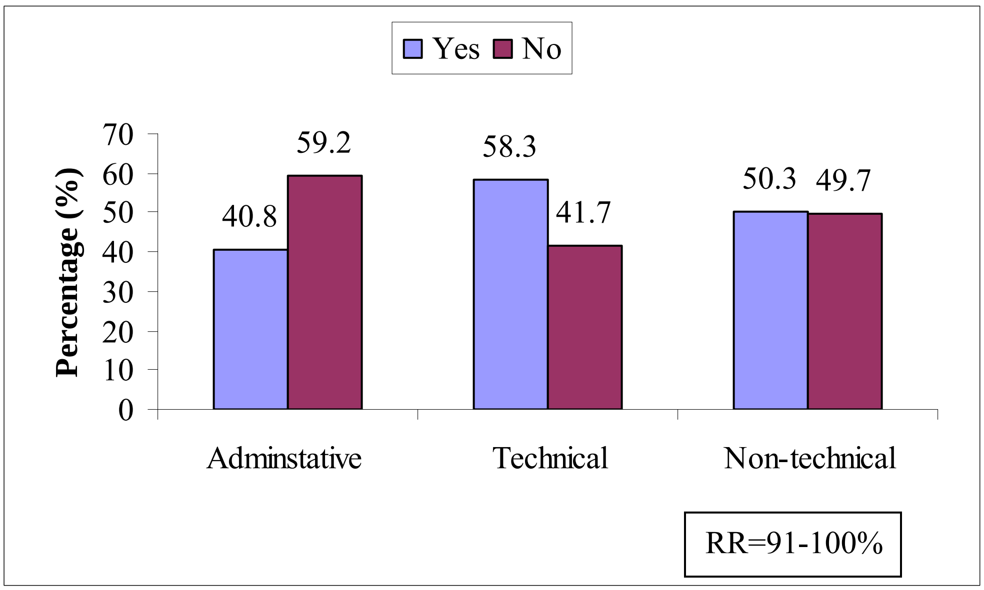

Figure 13: The percentage of industries that provide contracts for the employees

It appears that oral contract is very common in Ramallah industrial area. Less than fifty percent of the industries provide written contract to their staff (Figure 14). Oral contract was mentioned in the labor law but not in detailed way. Hence, industries owners are considered legally at the safe side when they use oral contract rather than written one. Oral and written contracts were mainly permanent contract; very few industries reported using temporary contracts.

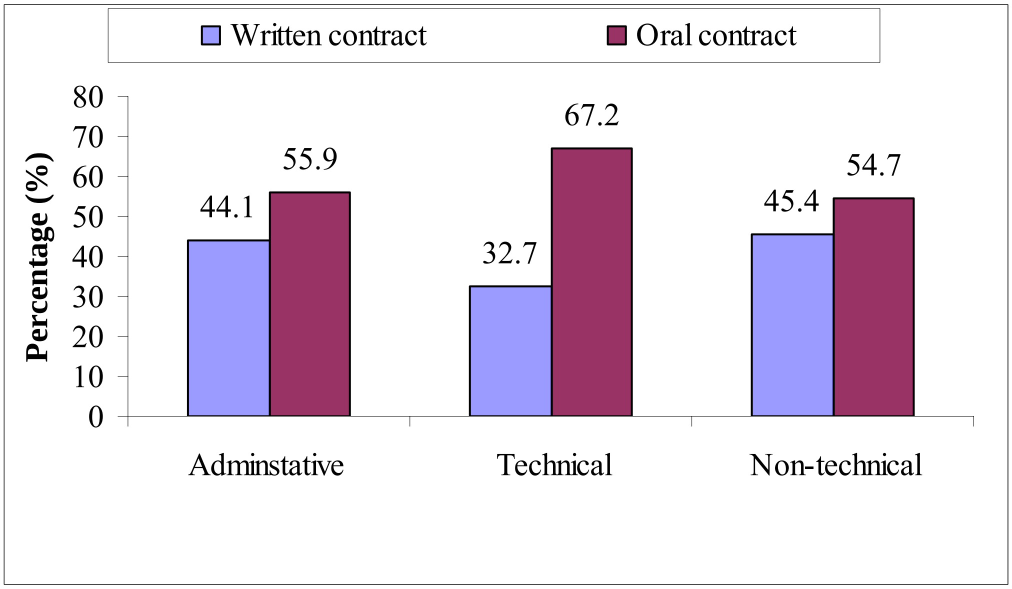

Figure 14: The percentage of industries that provide contract by type of contract

Industries which indicated having contract for their employees were asked whether the contract stated health and safety measures. Sixty seven percent (106) of these industries state health and safety measures in the contract. Nevertheless when the owners were asked to list the measures mentioned in the contract, 20% state administrative regulation rather than safety related measures.

Health and Safety

This section investigates whether the industry provides health insurance, injury insurance, initial check up, periodical check up, reasons of absenteeism, causes for injuries, types of injuries, place of body injuries, and presence of compensation policy. Almost all industries (91%) agree on the importance of taking safety measure at workplace within the industry.

More than half of the industries have at least one person who is in charge of implementing health and safety measures within the industry and 47% (144) of industries do not have anyone in charge.

Although not all industries have someone in charge of implementing health and safety measures in the industry, 56% (175) of the industries have instruction on health and safety inside the industry.

Unfortunately, when asked about the sources of health and safety instructions, three quarters of industries were personal initiative, only 7% were from ministry of health, 6% were from ministry of labor. It's important to note that each bar represents the yes for bar label and the remaining 100% are no answers (Figure 15).

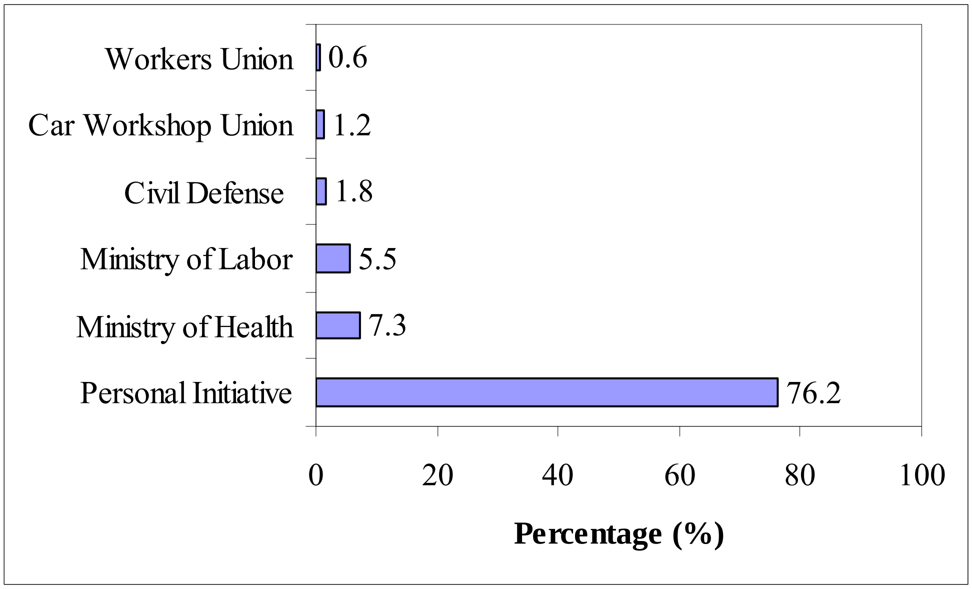

Figure 15: Source of instruction on health and safety

When owners were asked about providing injury insurance, 52% (160) responded positively and 48% (146) did not provide injuries insurance for their workers. Industries that provide injury insurance are mainly large industries with more than 4 workers.

On the other hand, only twenty percent of industries provide health insurance and 80% (243) of industries do not provide any kind of insurance at all for their workers. Industries providing health insurance are mainly textile, clothing and leather (all), chemical and pharmaceuticals (71%) and food/drinks and tobacco industries (57%).

Concerning medical check up, only sixteen industries (5%) had initial check up and the remaining industries just hire people with out initial check up. The scenario is worse when investigated periodical check up, where only five industries have periodical check up.

Within those industries which have periodical check up, three of them run check up every six month and two of them run check up every one year. These industries belong to food/drinks and tobacco and chemical and pharmaceuticals industries.

Health conditions and absenteeism

We tried to ask about workers health problems from the industry owners by asking first directly what are the main health problem that causes workers absenteeism. In the pilot study the owners felt threatened by this question. So we asked about the general reason for workers absenteeism. Health condition was one the listed items. Further, health condition item included a list of diseases some of them were related to work conditions and other were general diseases such as chronic disease, and obesity.

Figure 16 show the main reasons for workers absenteeism. Health conditions are the main reasons (81%). Family conditions and closure each account for more than half of the industries as main reasons for absenteeism.

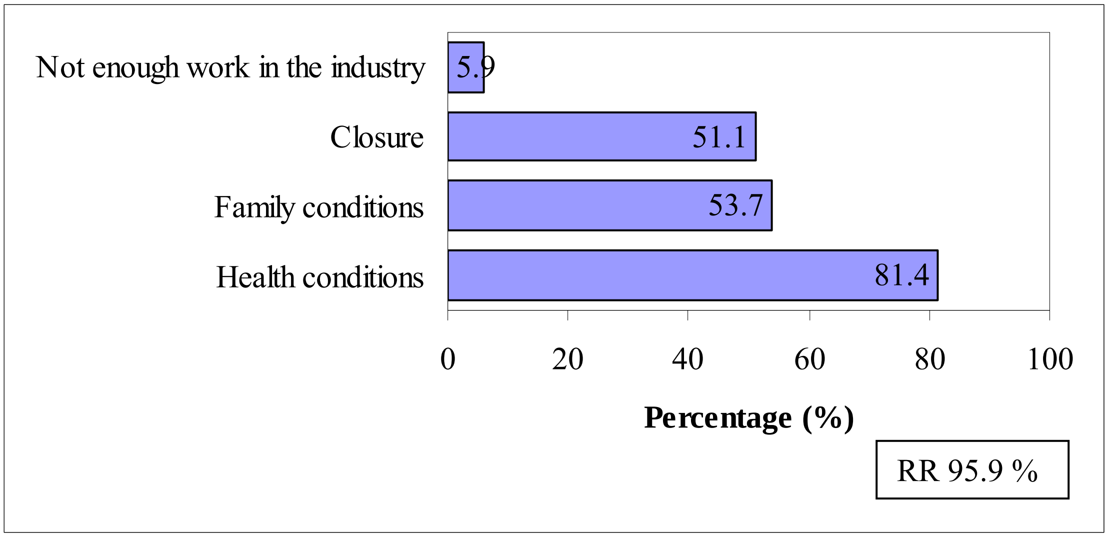

Figure 16: Reasons of absenteeism

Figure 17 indicated that seasonal diseases including cold and flu were the main reasons. This percentage was expected as the field work took place during winter. Further, the first answer reported by industries owners was health conditions not related to work conditions. Nevertheless, fatigue, reparatory illnesses and allergy were also mention with reasonable percentages. As mentioned previously, data on specific diseases could not be retrieved from the owners and further research asking the workers themselves would be very useful to understand the health conditions related to specific occupations.

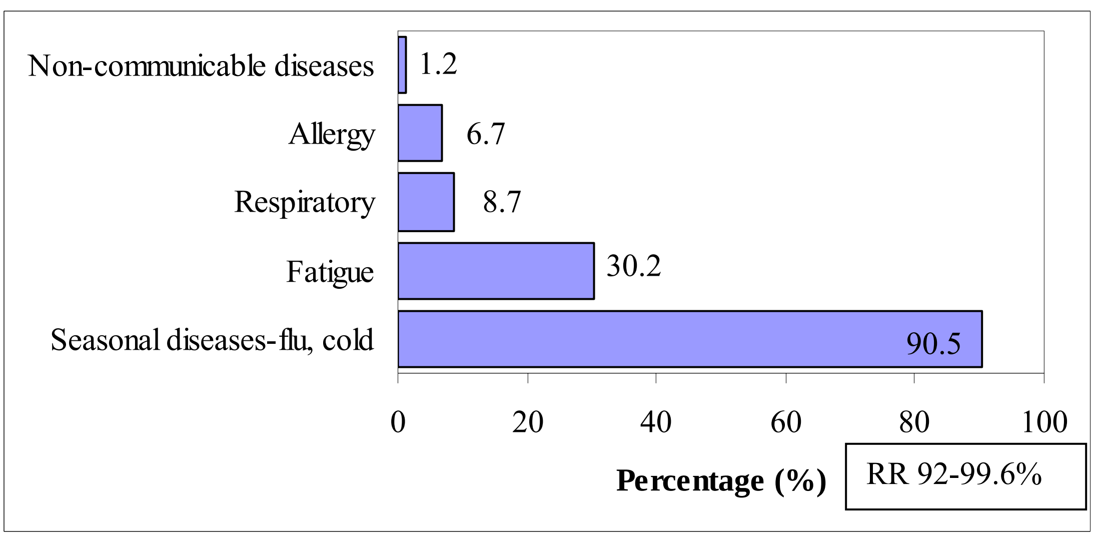

Figure 17: Main health conditions as reason for absenteeism

Injuries

According to industries owners the main reasons for injuries at workplace are ignorance of the worker or employers (57%), lack of experience, worker not focused or alert during work (35%), ignoring protective measures and clothing (16%). Basically, the main reason for injuries is the workers (Figure 18). Only 8% were due to work conditions and 4% due to lack of protective measure and clothing. These results showed be interpreted keeping in mind that these are owners perception and reasons mentioned by workers would be completely different with different percentages.

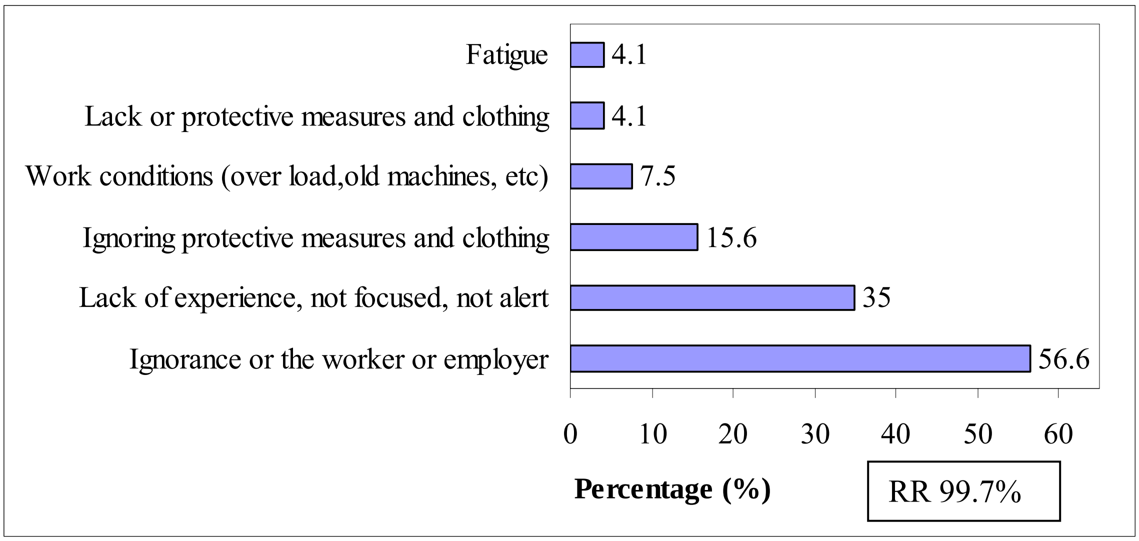

Figure 18: Main reasons for injuries during work

Talking about safety measures, a question of whether the industry provides protective clothing and tool for its employee is essential. Half of the industries do provide protective clothing or tools, 44% industries do not provide any means of protective measures and 16% think that there is no need for protective clothing or tools (Figure 19).

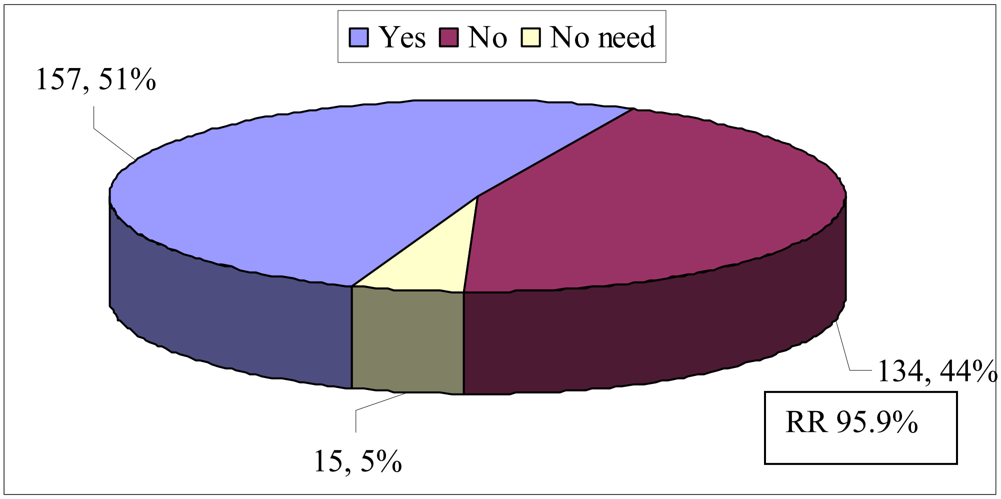

Figure 19: Industries providing protective tools for employees

Figure 20 show employees commitments to wearing protective clothing. According to industry owners, less than half the industries that provide the protective tools are committed to use them, and 15% never use them. Only twenty percent of industries reported having at least on injuries at their industries in the year. The number of reported injuries ranged between one to 10 injuries within one year.

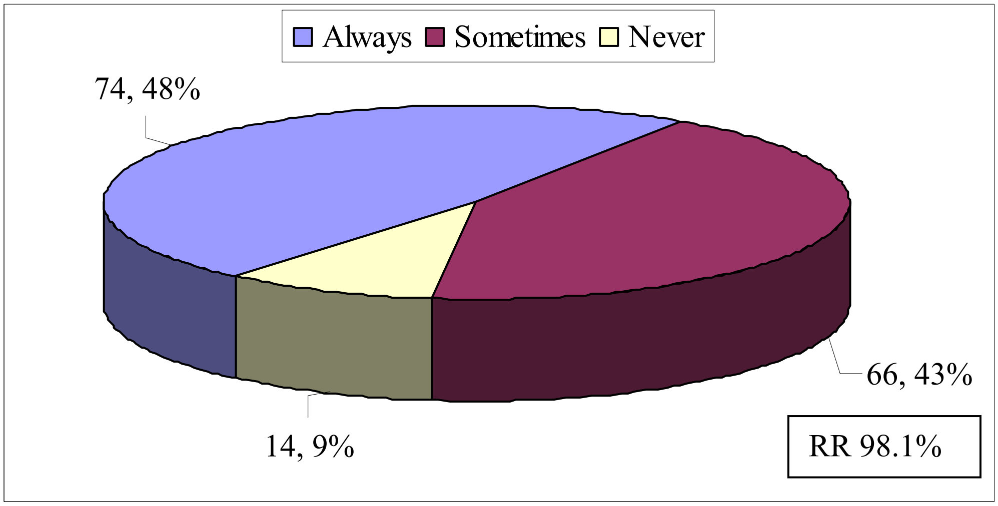

Figure 20: Worker commitment to wear protective clothing

The main injury sites were the upper limbs in 76% of the industries. Eye injuries were reported by 13% and lower limbs by 7% industries (Figure 21). These injuries were mainly wounds (68.4%), burns (12.5%), cuts (10.5%) fracture (8.9%) and Bruises (4%). A combination of more than one injury was also reported.

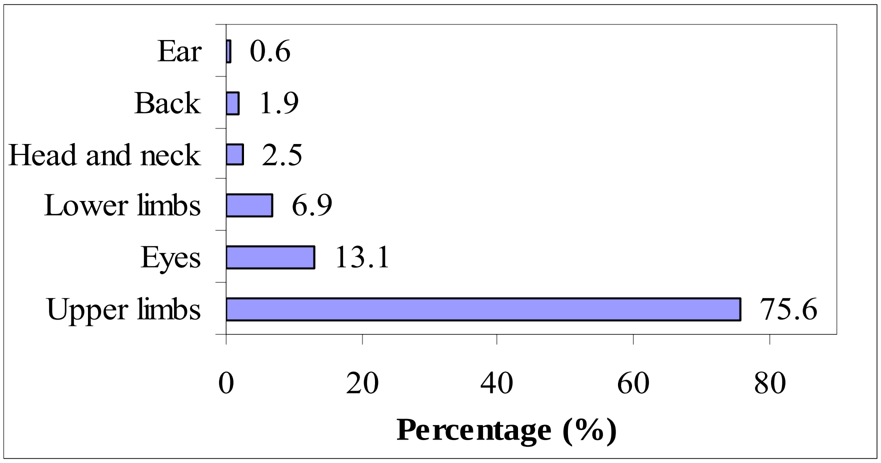

Figure 21: Most common sites of injuries

Thirty nine percent (119) of industries owners are aware of labor law section related to injury compensation and the remaining 61% (183) do not know about this section of labor law. This percentage is low compared to the percentage reported for owner knowledge about labor law in general. This is indication about how fragmented their knowledge is and the knowledge they have is finance and money related.

Around two thirds of the industries pay injury compensation. Liking this to those who provide health insurance, 44% of all industries provide both injury insurance and pay injury compensation, 17% of all industries pay injury compensation and do not provide injury insurance, 9% of all industries provide injury insurance and do not pay injury compensation, and the remaining industries 29% do not provide injury insurance nor pay compensation (Figure 22).

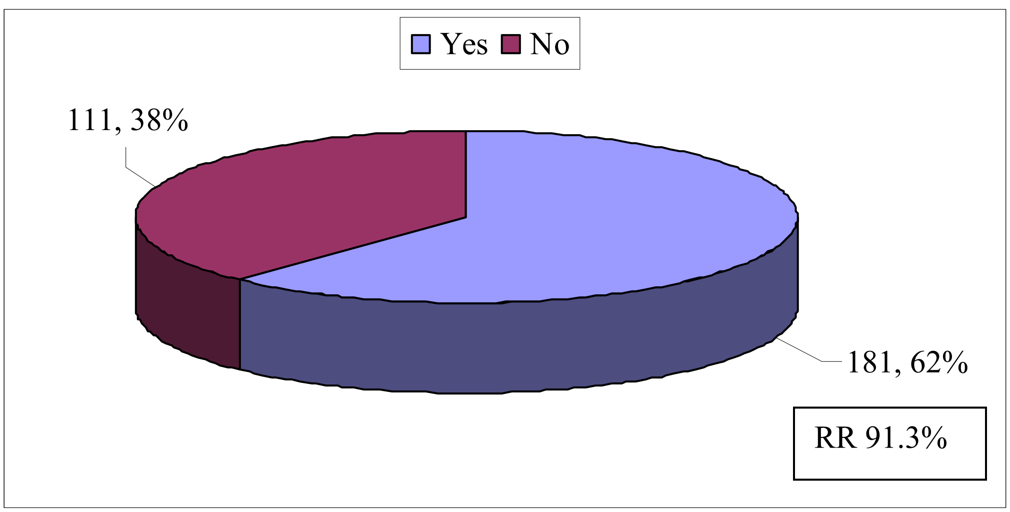

Figure 22: Injury compensation

Workers / labor union

Up to industries owners' knowledge, only 28 industries their workers are affiliated the workers/labor union, 7% don't have an idea if the workers in their industries are affiliated the workers/labor union and 70% industries their workers are not affiliated the workers union (Figure 23). Workers/labor union here included any union, which might be occupation specific that works for workers benefit and protection. This percentage is even lower than that reported by PCBS work condition survey 31%. This low percentage was explained by workers not convinced with the union's performance and also to union affiliation rules.

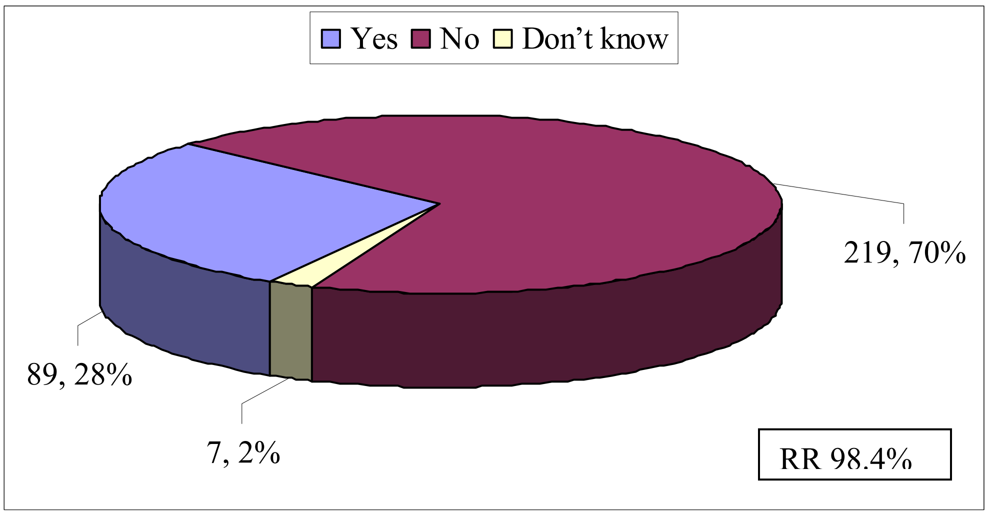

Figure 23: Industries owners' knowledge about workers joining the labor union

Out of all industries, 13 industries reported that they had cases admitted by the labor union. Four cases were related to health and safety conditions. Two cases were reported for the same industry, in addition to two other cases in separate industries.

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