



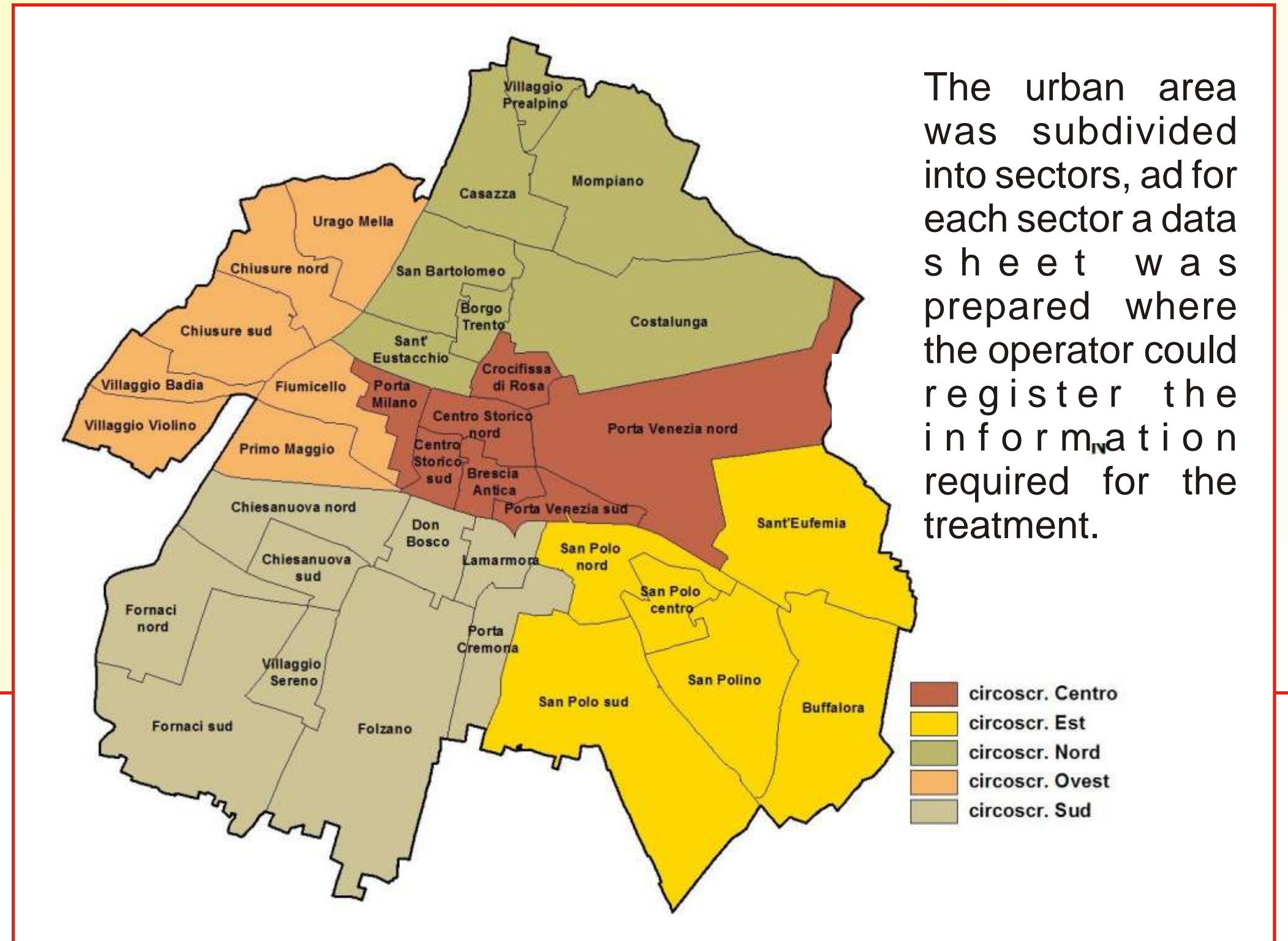
QUALITY CONTROL METHODS IN THE AEDES ALBOPICTUS SUPPRESSION PROGRAM OF BRESCIA

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Quality control is a process employed to ensure a certain level of quality in the mosquito control service. It may include whatever actions are deemed necessary to provide for the verification that the services meet the specific technical and contract requirements, and are dependable, satisfactory, and financially sound. To this aim, the establishment of procedures and tools that allow to track the interventions (who make the intervention, when and how) is just as important to quality control as overseeing the overall activity.

The Environmental Bureau of the Brescia Municipality, advised by the Centro Agricoltura Ambiente "G. Nicoli", established specific procedures for the quality control of the mosquito larvicidal treatments in 2010, with particular attention to the following items:

- organization of the work;
- verification that interventions were actually performed within the time required;
- time spent for the treatments;
- treatment efficacy.



	1 working day	2 consecutive working days	>2 consecutive working days
1 st treatment	9	26	1
2 nd treatment	13	22	1
3 rd treatment	14	21	1
4 th treatment	14	19	3
5 th treatment	7	23	6
total %	32%	62%	7%

TIME REQUIRED FOR THE TREATMENT

Catch basin treatment was generally started in the afternoon and all the treatment of the catch basins in one sector was generally concluded on the next day, except in case of rain, or if it was necessary to complete previously suspended treatments in other sectors.

interval between treatments	percentage
< 25 days	12%
25-30 days	78%
>30 days	10%

The percentages on the right refer to single sectors. They were calculated from the beginning of the treatment as if the work was concluded on the same day. The information available allows verifying the time spent for the treatment of each single street.

Contract requirement A

- Within one sector the treatments have to be concluded within 2 days.
- The same catch basin needs to be treated at least once a month. This time lapse is compatible with the persistence of the larvicidal product (liquid formulation of diflubenzuron).

PERSONNEL ORGANIZATION



	percentage
areas managed by a single operator	25%
areas managed by 2 operators only	28%
areas managed by 3 or more operators	47%
areas managed by 2 or more operators simultaneously	14%

In 2010, the requirements concerning the distribution of the work among the group of technicians were largely disattended, but this provided a satisfactory respect of the time required for the treatment according to the contract. Five technicians were employed for the treatments, but 75% of the interventions were performed by two of them.

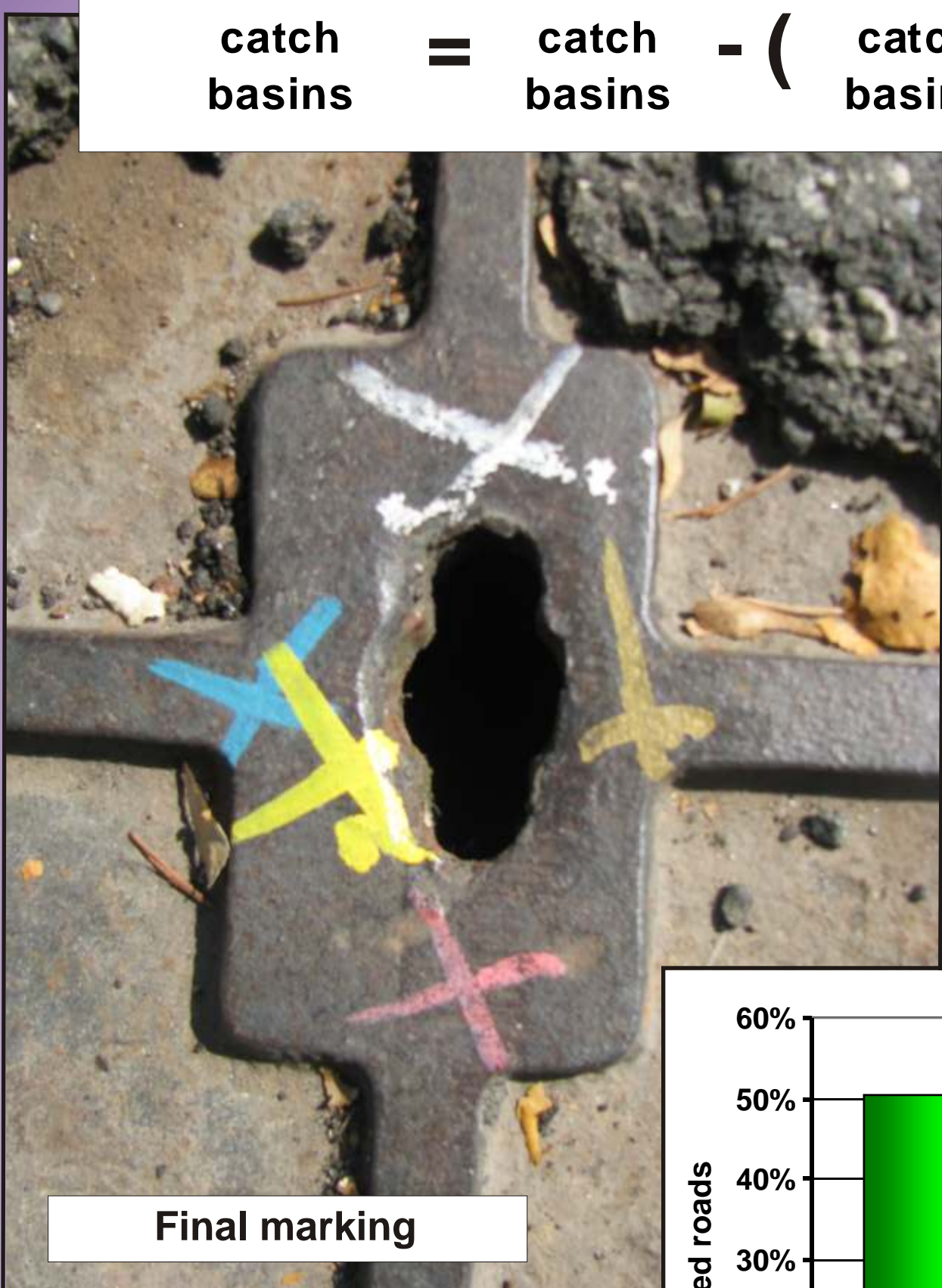
Contract requirement B

- The pest control company charged of the treatments is requested to employ of the same personnel for the work in the same sector.
- In order to avoid involuntary skip or repetition of the treatments of catch basins, it is preferable to employ one single technician per sector.

Knowing the number and distribution of the catch basins in the town, the quality control procedure aim to verify and quantify the number of non treated catch basins in addition to those declared by the technician.

MARKING CATCH BASINS

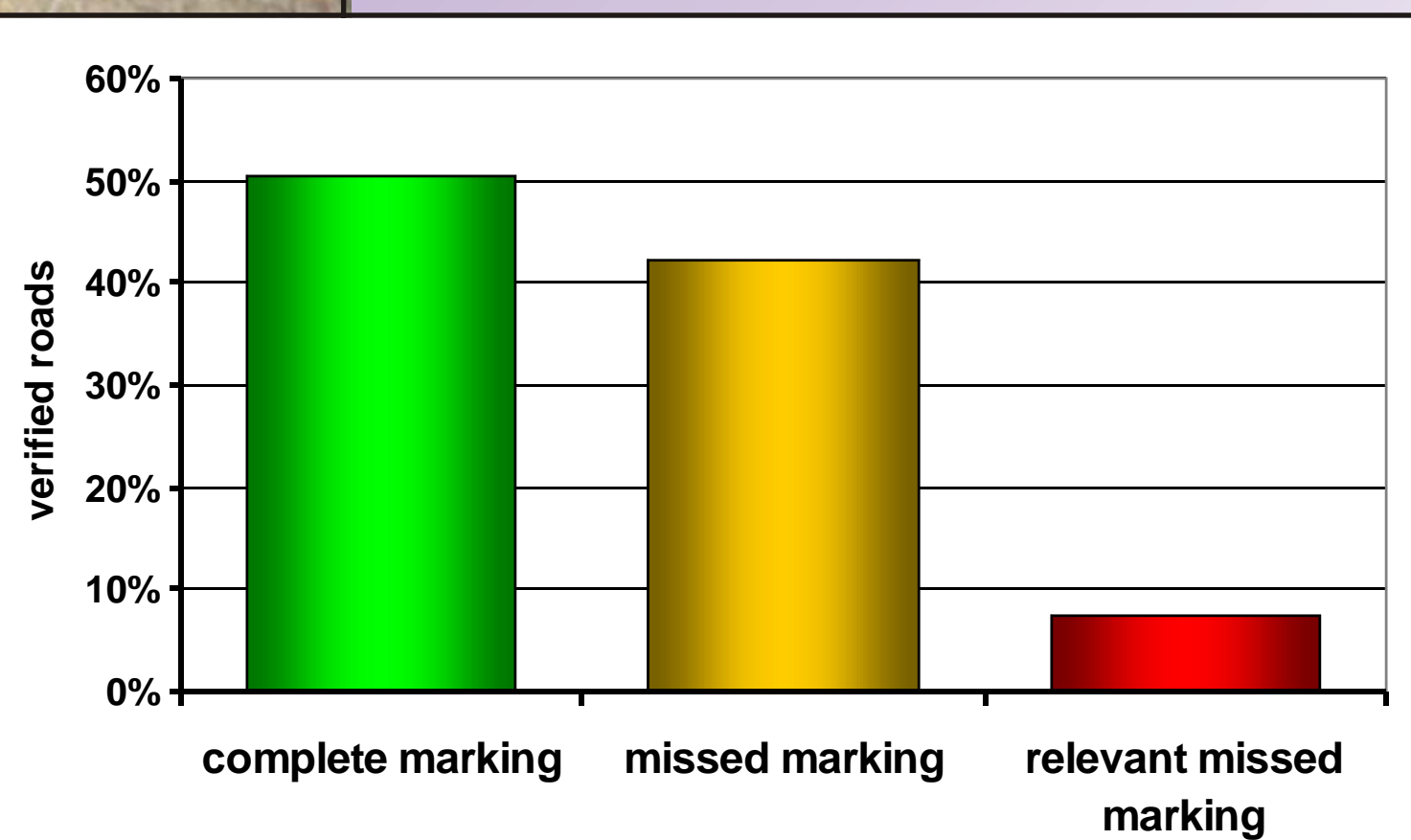
$$\text{Non-treated catch basins} = \text{Censored catch basins} - (\text{Marked catch basins} + \text{Non-treated declared catch basins} + \text{Hidden catch basins})$$



The omission of the colour marking onto the catch basin sometime concerned isolated not easily accessible catch basins or long portion of a street.

The number and the percentage of the non treated catch basins with respect to the total number of catch basins present along the street were calculated.

In 2010, we depicted the results of the 360 quality control on the treated catch basins by categorizing the data into three quality levels.



In case of relevant missed marking a free treatment was requested to the company in charge.

Contract requirement C

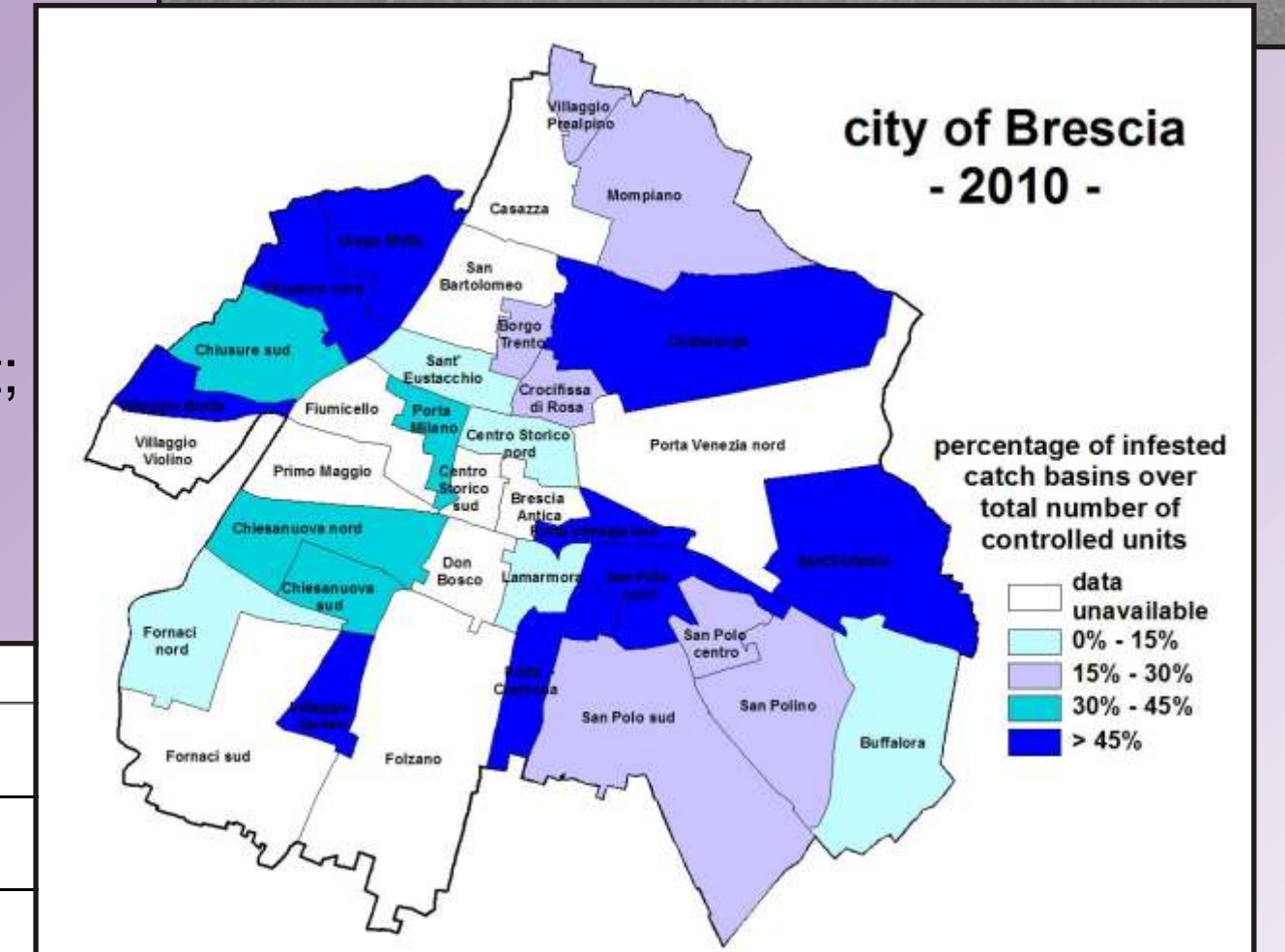
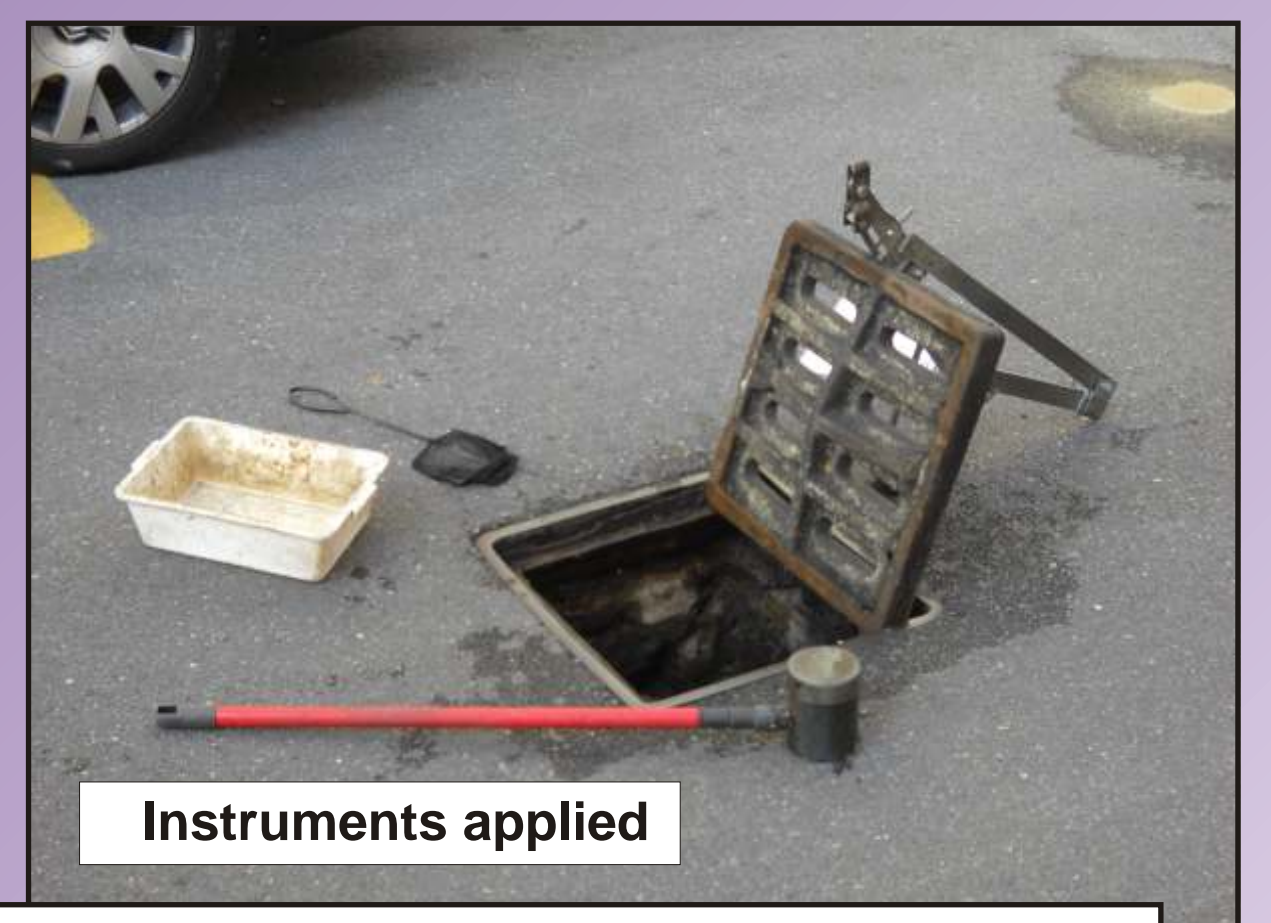
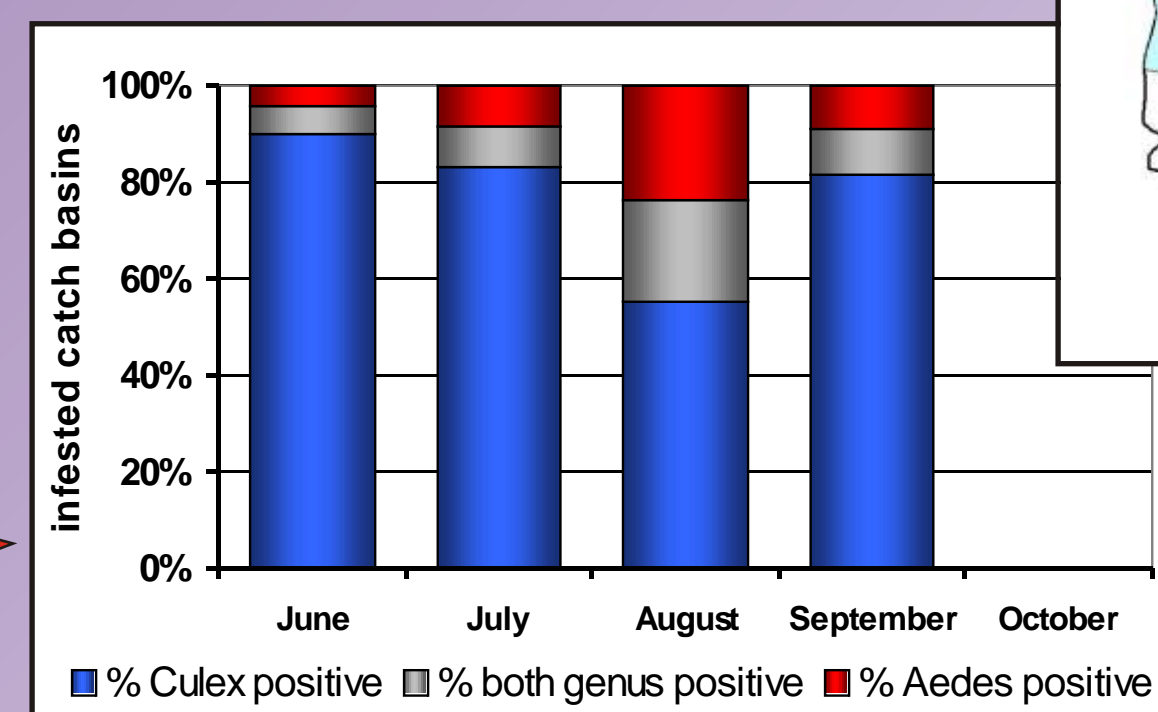
- Technicians have to mark the treated catch basins with a waterproof pencil, whose colour was predetermined for every cycle of treatment.
- Technicians have to register on the data sheet all the catch basins that could not have been treated, due, for example, to the presence of cars.

EFFICACY

The efficacy of larval control is determined by sampling the catch basins with a dipper or a water net, within a time window of 10-20 days from the treatment. Randomized samplings have to be performed on the 0.8 % of the total number of catch basins for each treatment cycle.

The inspector registers the density of old larvae and pupae by mosquito species. These data can be analyzed according to several different variables:

- treatment dosage;
- treatment volume;
- elapsed time since the treatment;
- catch basin characteristics;
- sampling method (dipper or water net).



The population dynamic of *Aedes* and *Culex* in the infested catch basin can be evaluated (on the left) together with the frequency of colonization (egg batches and young larvae included) (see above).

Contract requirement D

- For the treatments of the catch basins diflubenzuron-based products have to be used, at the dose of 0.30-0.35 mg/catch basin of active ingredient and applying the treatment with a minimum volume of 30 cc/catch basin.