CONSTRUYA

ASSESSMENT OF VULNERABILITY AND HABITABILITY IN INTERVENTIONS CONDUCTED BY TRAINED MASTER BUILDERS

ASSESSMENT REPORT PREVIEW · JAN-MAY 2023



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HILTI The Foundation.

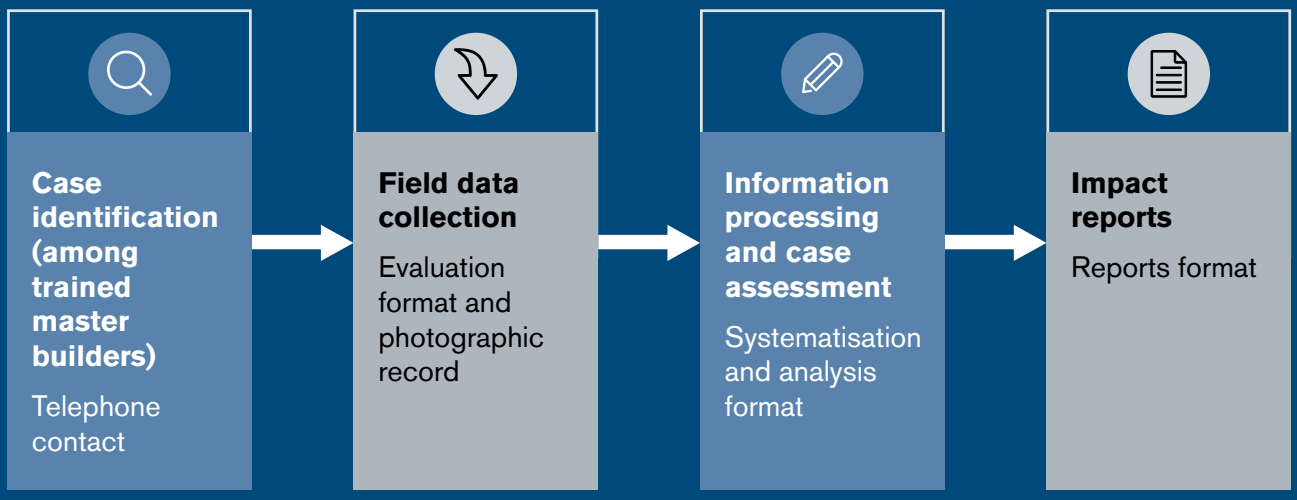
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I. Methodology

Casuistic methodology based on the identification of works in progress conducted by master builders trained by Construya partners.



II. Analysed Indicators



1

The trained worker performed better than an untrained worker (reduction in bad construction practices).



2

Construction quality accomplished by the trained master builder.

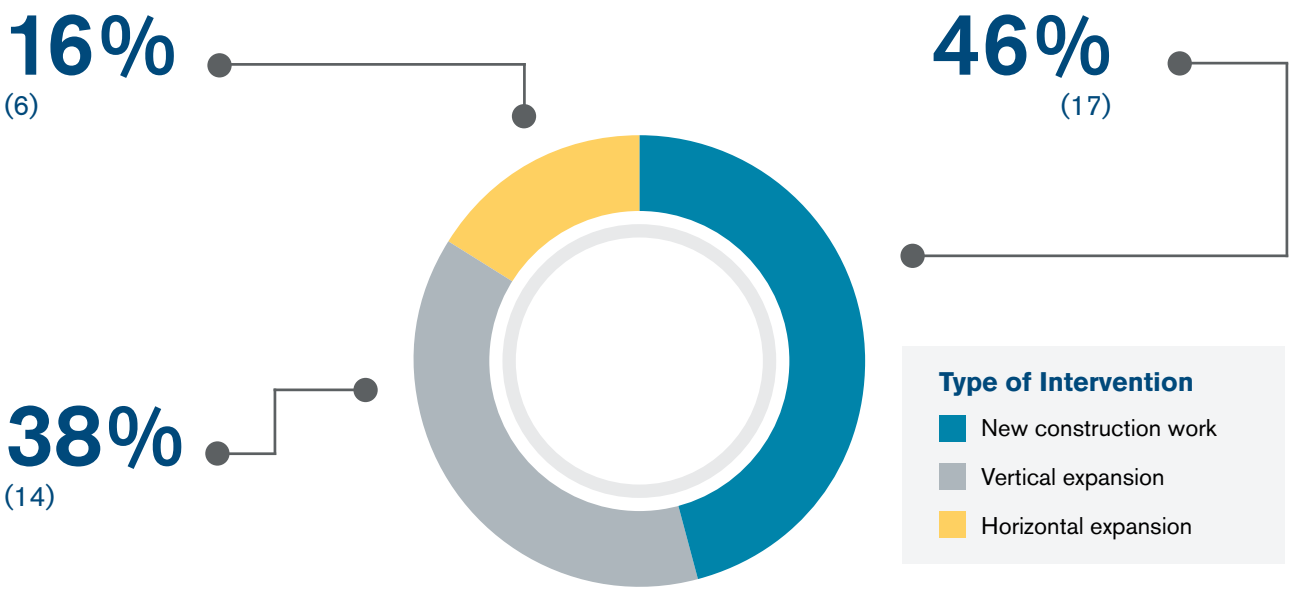


3

Effect of the intervention in the vulnerability and habitability conditions of the housing.

III. General Characterisation of the Assessed Cases

SAMPLE TOTAL BY TYPE OF INTERVENTION



All cases meet the criteria for a vulnerability assessment.
5 of them meet the criteria for an habitability assessment.

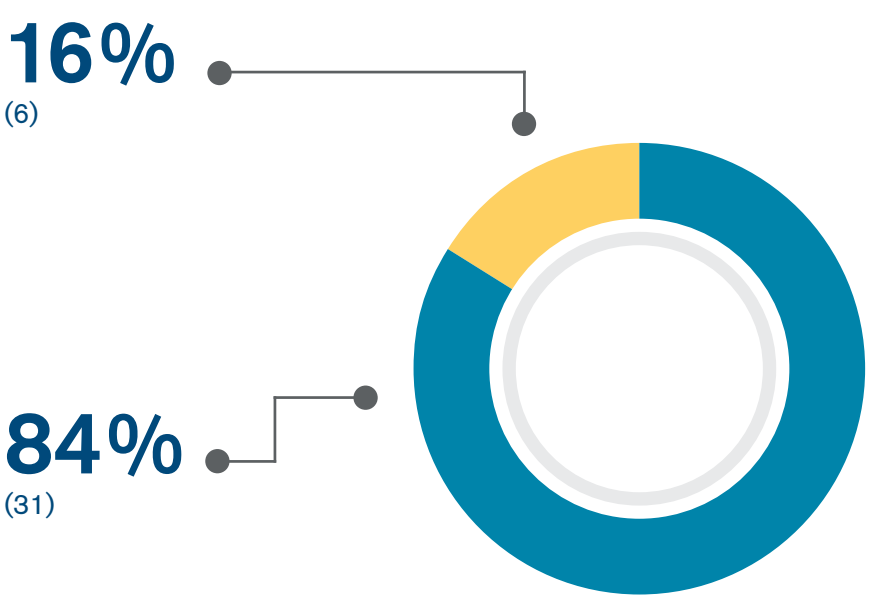
Type of Intervention	Number
New construction work	17
Vertical expansion	14
Horizontal expansion	6
Total	**37**



Distribution

37 cases in 17 districts of Lima metropolitan area and Lima Province.

USE OF BLUEPRINTS IN THE ASSESSED INTERVENTIONS



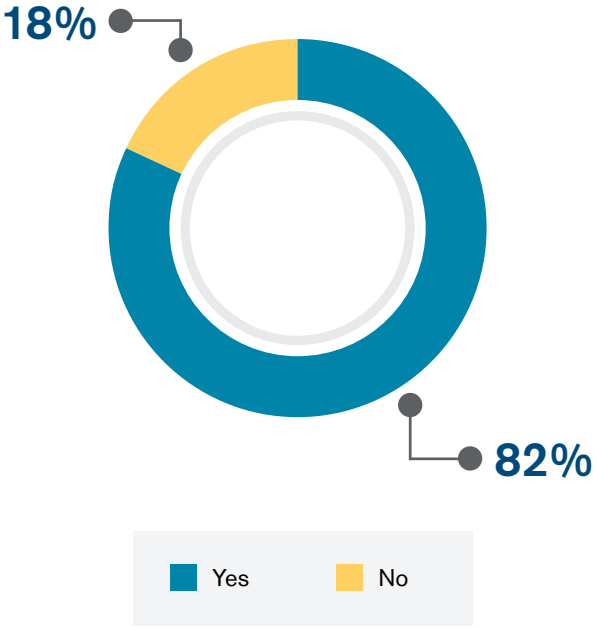
Use of blueprints	Number
Yes	31
No	6
Total	**37**

Use of blueprints in construction works

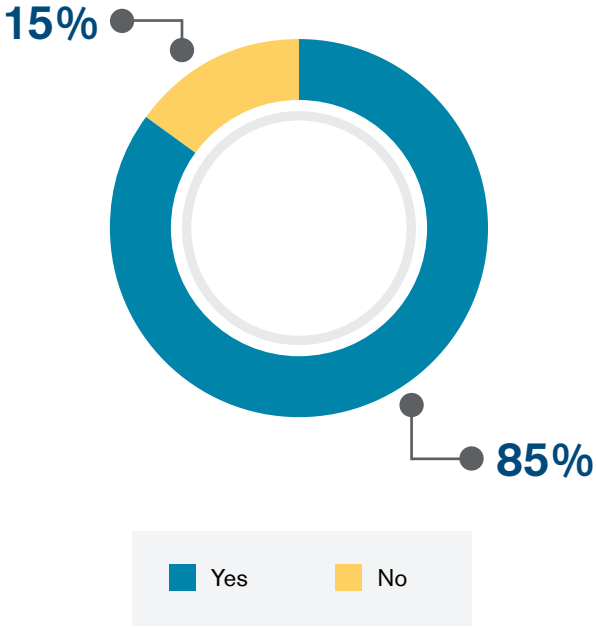
Yes

No

USE OF BLUEPRINTS IN **NEW** CONSTRUCTION WORKS



USE OF BLUEPRINTS IN **EXISTING** CONSTRUCTION WORKS



IV. Results of the assessed indicators

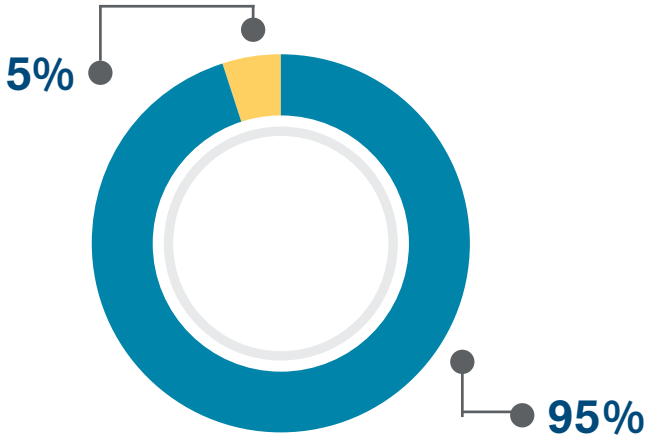


1. Comparative Between Trained and Untrained Master Builder

The measurement of this indicator begins with the identification of the bad practices that commonly occur in the construction of houses in vulnerable urban sectors, in order to later establish which and how many were found in the construction work. The trained master builder is considered to have performed better than an untrained worker when he avoids at least 50% of the bad construction practices.

RESULTS

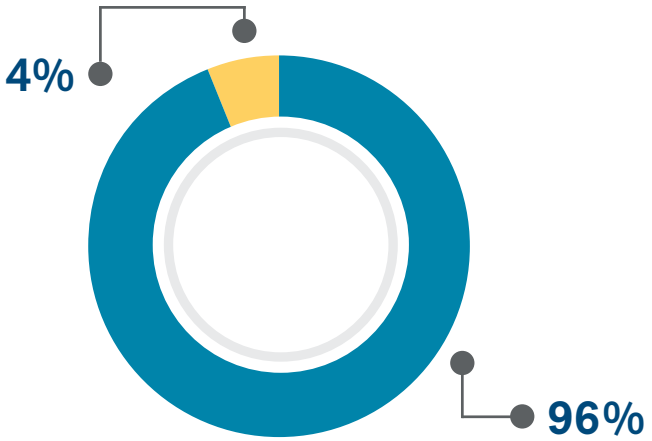
APPLICATION OF GOOD PRACTICES IN **EXISTING** CONSTRUCTION WORKS



- Performed **BETTER** to an untrained worker.
- Performed **EQUAL** than an untrained worker.

19 trained workers applied good practices in existing construction works.

APPLICATION OF GOOD PRACTICES IN **NEW** CONSTRUCTION WORKS



- Performed **BETTER** to an untrained worker.
- Performed **EQUAL** than an untrained worker.

16 trained workers applied good practices in new construction works.

Note: 2 trained workers still incur in bad practices in their construction works.

2. Quality of the Intervention

The quality of the trained master builder's intervention is assessed exclusively through the different types of construction components (walls, columns, beams, slabs, others) that were observed during the visit, considering some general aspects, such as:

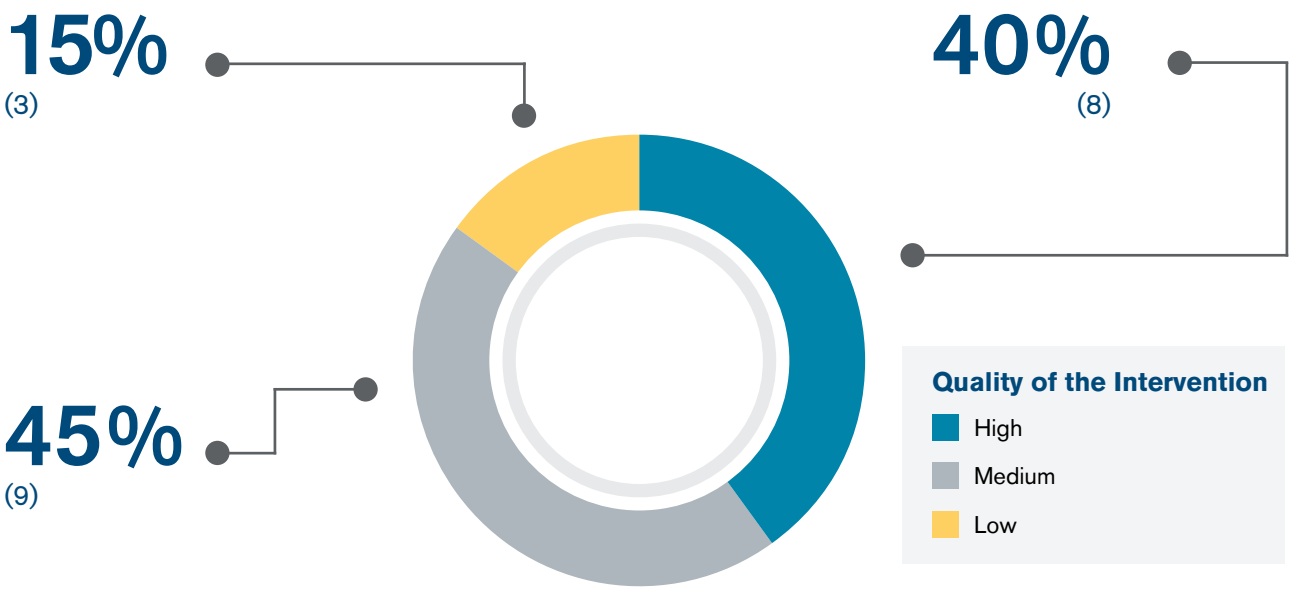
- Material quality.
- Adequate quantity or proportion of the materials used.
- Proper construction process.

Some external factors also affect the evaluation of the quality of the intervention indicator, such as: the family's choice in the purchase of quality materials and the experience of the crew's workforce.



RESULTS

QUALITY OF THE INTERVENTION IN **EXISTING** CONSTRUCTION WORKS

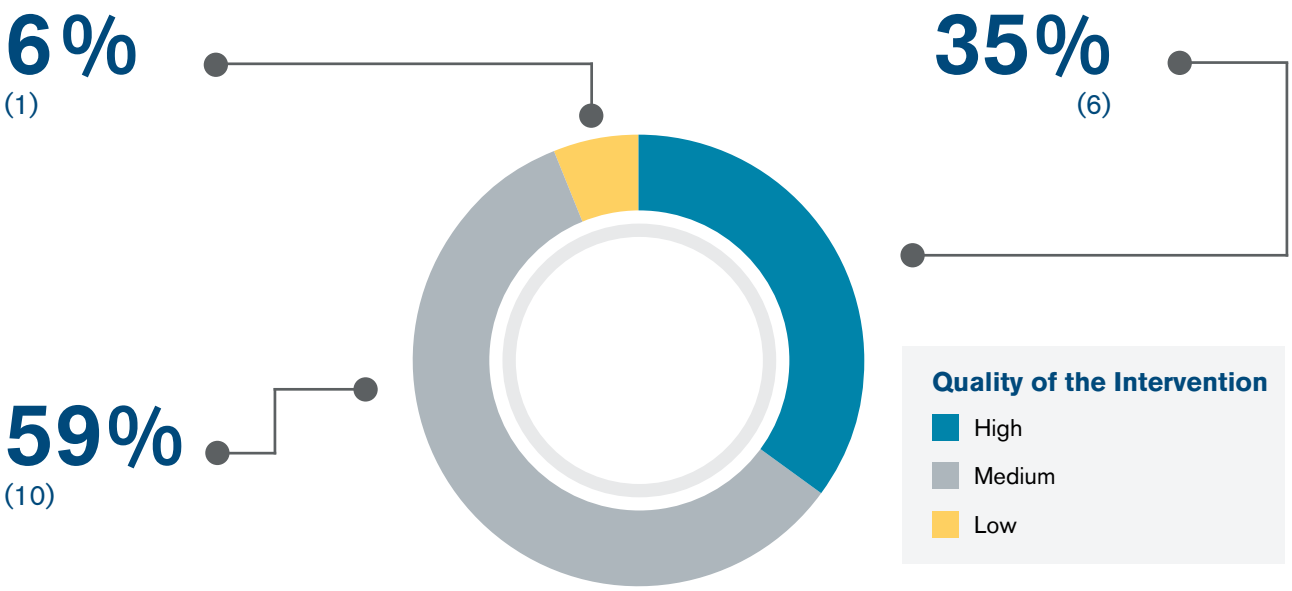


Quality of the Intervention	Number
High	8
Medium	9
Low	3
Total	**20**

- 8 of the analysed cases revealed a high intervention quality. 3 of them revealed a low quality, either due to the use of inadequate materials or to the quality of the construction process.
- The other 9 cases revealed a medium quality level.

RESULTS

QUALITY OF THE INTERVENTION IN **NEW** CONSTRUCTION WORKS



Quality of the Intervention	Number
High	6
Medium	10
Low	1
Total	**17**

- In new construction works, 6 of the cases revealed a high quality level, 10 of them, a medium quality and 1 presented a low quality.

3. Incidence of the Intervention Regarding Seismic Vulnerability

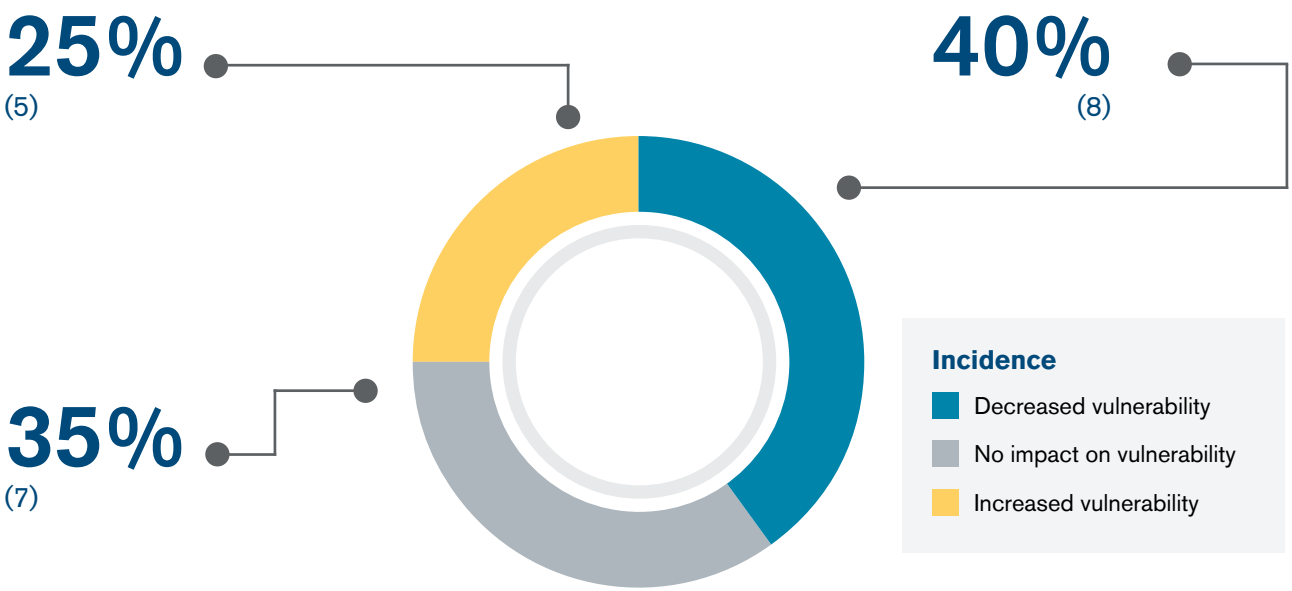
There are determining factors (in the home and in the environment) beyond the skills acquired by the trained master builder that affect vulnerability —e.g.: type of soil and topography, design, conditions of existing structures, construction aspects, existence of plans, among others. In this sense, the skills of the master builder are not enough to achieve a positive result.

Existing works: Analysis of the house based on the intervention performed by the trained master builder and how said intervention impacts the pre-existing conditions of vulnerability.

New works: Analysis of the construction work performed by the trained master builder, as well as of how said construction had a favourable impact on aspects of design, the layout of the foundations, and the projections of the structures, which limits future vulnerability risks.

RESULTS

LEVEL OF VULNERABILITY IN **EXISTING** CONSTRUCTION WORKS

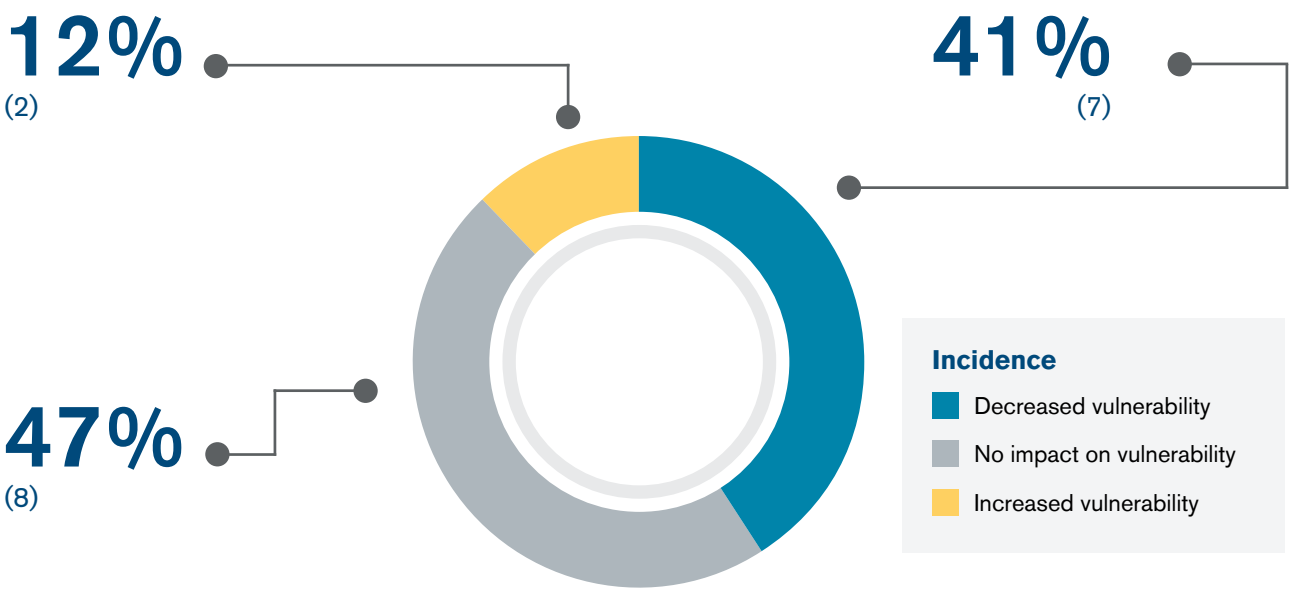


Incidence	Number
Decreased vulnerability	8
No impact on vulnerability	7
Increased vulnerability	5
Total	**20**

- In 8 of the cases, the intervention had a positive impact on vulnerability. They consist of: 5 vertical expansions of 1st and 2nd floor, and 3 horizontal expansions performed on the ground level.
- In 7 of the analysed houses, the intervention did not affect vulnerability, which is still a positive result compared to the tendency observed among untrained master builders.
- In 5 of the existing construction works the intervention affects vulnerability, because of the considerations previously explained. They consist of 4 vertical expansions and 1 horizontal.

RESULTS

LEVEL OF VULNERABILITY IN **NEW** CONSTRUCTION WORKS



Quality of the Intervention	Number
High	7
Medium	8
Low	2
Total	**17**

- 15 cases showed conditions from which limited seismic vulnerability can be expected, while 2 houses have a high risk condition.