

# HUMAN PAPILLOMA VIRUS DETECTION IN RESOURCE-LIMITED REGIONS

## Current situation

- > 500,000 affected women per year
  - 9 from 10 women who die from cervical cancer are in poor countries
- ≈ 250,000 women die  
of cervical cancer per year**

## CERVICAL CANCER: AN NCD WE CAN OVERCOME

Dr Tedros Adhanom Ghebreyesus, 19<sup>th</sup> May 2018  
Director-General, World Health Organization

“Cervical cancer strikes women in the prime of life.”

“You don’t need me to remind you of the terrible toll taken by cervical cancer.”

“Cervical cancer affects over half a million women each year, and kills a quarter of a million. One woman dies of cervical cancer every two minutes, making it one of the greatest threats to women’s health.”

“Each one is a tragedy, and we can prevent it.”

“If we don’t act, deaths from cervical cancer will rise by almost 50% by 2030.”

“These women are raising children, caring for their families and contributing to the social and economic fabric of their communities.”

**“Please join us  
in making  
cervical cancer history.”**

## HUMAN PAPILLOMA VIRUS DETECTION IN RESOURCE-LIMITED REGIONS

Screening programmes for Human Papilloma Virus (HPV) infections are known to be an effective way to reduce the risk to develop cervical cancer.

To avoid cervical cancer is – besides the humanitarian aspect for each individual – of substantial socio-economic and financial impact for each society.

In order to offer HPV prophylactic screening to the risk group in developing countries the following parameters have to be taken into account:

- Necessary health and laboratory infrastructure
- Costs for the equipment
- Costs per test
- Number of cases which one lab or technician can handle

## SUMMARY

In order to overcome existing structural and financial limitation we have developed a low cost stand-alone easy to use gel-electrophoresis device.

In addition we can offer the full range of primer kits for all risk virus strains, which can be used as mixed, freeze dried, ready to use PCR kits. A cooling chain for the reagents is not needed any longer.

The individual virus recognition is based on a specific signal in the gel-electrophoresis detection (PCR product length) of each virus strain.

In summary, the new gel-electrophoresis device in combination with advanced PCR techniques, does substantially reduce initial costs for the laboratory equipment and the costs per test.

### LABORATORY EQUIPMENT

#### DNA Isolation

Pipettes (Set)	600.00 €
Centrifuge 15,000 rpm	1,300.00 €

**1,900.00 €**

#### PCR

Thermocycler for 96 tests in parallel	2,700.00 €
E-CUBE gel-electrophoresis device	4,860.00 €

**Total 7,560.00 €**



**Fig. 1:** The needed laboratory equipment are a centrifuge, a PCR-cycler and the gel-electrophoresis device E-CUBE.

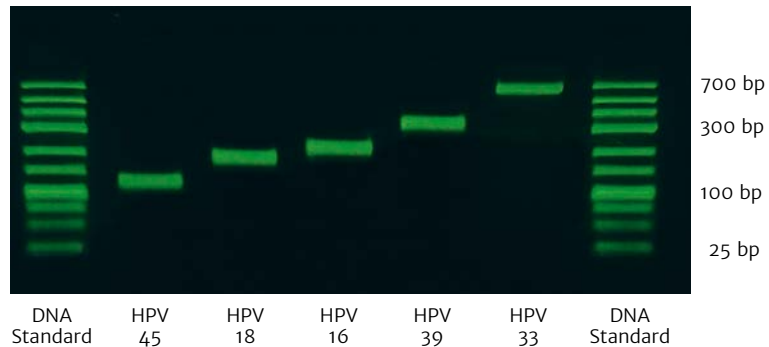
### MULTIPLEX HPV PCR TEST

#### Costs per double test for the detection and identification of 14 high risk HPV strains

A: HPV 16, 18, 31, 33, 35, 39, 45	6.30 €
B: HPV 51, 52, 56, 58, 59, 66, 68	6.30 €
Gel-electrophoresis for both amplifications	0.80 €

**Total 13.40 €**

## EXAMPLE FOR THE DETECTION OF HPV 16, 18, 33, 39 AND 45:



**Fig. 2:** Single detection of HPV 45 (126 bp), HPV 18 (192 bp), HPV 16 (224 bp), HPV 39 (334 bp) and HPV 33 (665 bp) distinguished by gel-electrophoresis.

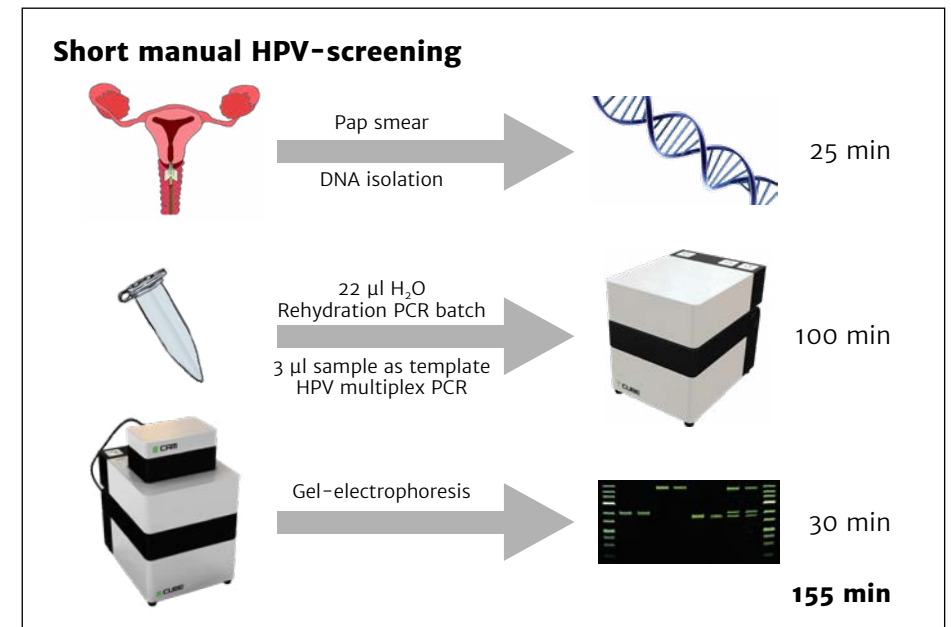
The Cytects HPV PCR-Test could be a small gear of your national HPV preventing programme.



## HPV DETECTION WORKFLOW

The scheme below shows the workflow from sampling to analysis by gel-electrophoresis and the duration.

Taking into account that up to 20 samples can be handled in parallel by one laboratory and one technician, up to 60 samples can be analysed per 8 hours working day.





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