**Data S1. Electronic database search strings.**

*PubMed:* (((((((HPV[tiab]) AND (breast cancer[tiab])) OR ((HPV[tiab]) AND (breast carcinoma[tiab]))) OR ((HPV[tiab]) AND (mammary carcinoma[tiab]))) OR ((human papillomavirus*[tiab]) AND (breast cancer[tiab]))) OR ((human papillomavirus*[tiab]) AND (breast carcinoma[tiab]))) OR ('human papillomavirus*'[Title/Abstract] AND 'mammary carcinoma'[Title/Abstract])) OR ('human papillomavirus*'[Title/Abstract] AND 'mammary carcinoma'[Title/Abstract]))))))))

*SCOPUS:* ( ( TITLE-ABS-KEY ( hpv ) AND TITLE-ABS-KEY (breast AND cancer)) AND PUBYEAR >2002) AND ((TITLE-ABS-KEY (hpv) AND TITLE-ABS-KEY (breast AND carcinoma)) AND PUBYEAR >2002) AND ((TITLE-ABS-KEY (hpv) AND TITLE-ABS-KEY (mammary AND carcinoma)) AND PUBYEAR >2002) AND ((TITLE-ABS-KEY (human AND papillomavirus) AND TITLE-ABS-KEY (breast AND cancer)) AND PUBYEAR > 2002 ) AND ((TITLE-ABS-KEY (human AND papillomavirus) AND TITLE-ABS-KEY (breast AND carcinoma)) AND PUBYEAR >2002) AND ((TITLE-ABS-KEY (human AND papillomavirus) AND TITLE-ABS-KEY (mammary AND carcinoma)) AND PUBYEAR >2002) AND (LIMIT-TO (DOCTYPE, «ar»)) AND (LIMIT-TO (PUBSTAGE, «final»)) AND (LIMIT-TO (SRCTYPE, «j»)) AND (LIMIT-TO (LANGUAGE, «English»))

Figure S1. Preferred reporting items for systematic reviews and meta-analysis flowchart. HPV, human papillomavirus; PCR, polymerase chain reaction.
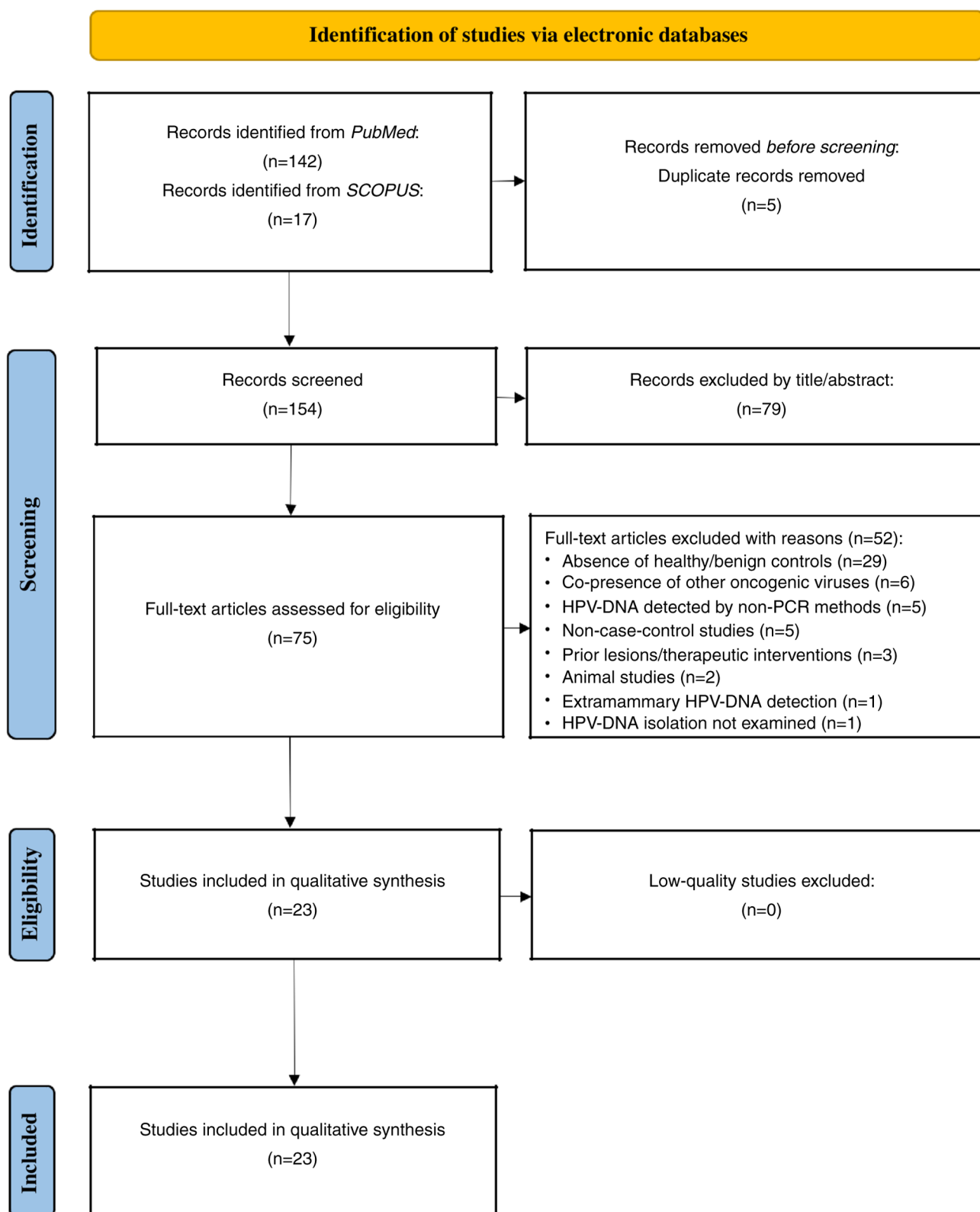
## Identification of studies via electronic databases

**Identification**

Records identified from *PubMed*:
(n=142)
Records identified from *SCOPUS*:
(n=17)

Records removed *before screening*:
Duplicate records removed
(n=5)

**Screening**

Records screened
(n=154)

Records excluded by title/abstract:
(n=79)

Full-text articles assessed for eligibility
(n=75)

Full-text articles excluded with reasons (n=52):
- Absence of healthy/benign controls (n=29)
- Co-presence of other oncogenic viruses (n=6)
- HPV-DNA detected by non-PCR methods (n=5)
- Non-case-control studies (n=5)
- Prior lesions/therapeutic interventions (n=3)
- Animal studies (n=2)
- Extramammary HPV-DNA detection (n=1)
- HPV-DNA isolation not examined (n=1)

**Eligibility**

Studies included in qualitative synthesis
(n=23)

Low-quality studies excluded:
(n=0)

**Included**

Studies included in qualitative synthesis
(n=23)

Figure S2. Forest plot.