What will life be like for cytoscientists/cytotechnicians in the HPV primary screening era?

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National Training Day

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Equity

- achieving equity across all population groups, particularly for Maori to respect the provisions of Te Tiriti o Waitangi and also for Pacific women, is a key issue across health including cervical screening
  - HPV primary screening and self-testing should help a lot
  - different resources will be needed for those who don't currently participate in screening: change is needed in primary/community care
- we need to continue to provide a high-quality laboratory reporting service for all who choose to participate in cervical screening
  - Cultural sensitivities and appropriateness for the laboratory sector will continue to be reviewed

Clinical Practice Guidelines

- *Clinical Practice Guidelines for Cervical Screening in New Zealand 2020*

for the current cytology-based programme are available on the NSU website at:

https://www.nsu.govt.nz/system/files/resources/final_ncsp-guidelines-for-cervical-screening-new-zealand-5_june_2020.pdf

Includes:

an overview of cervical screening in New Zealand

age range and screening interval

provide guidelines for managing women with abnormal results

including women in special clinical circumstances

hrHPV testing guidelines

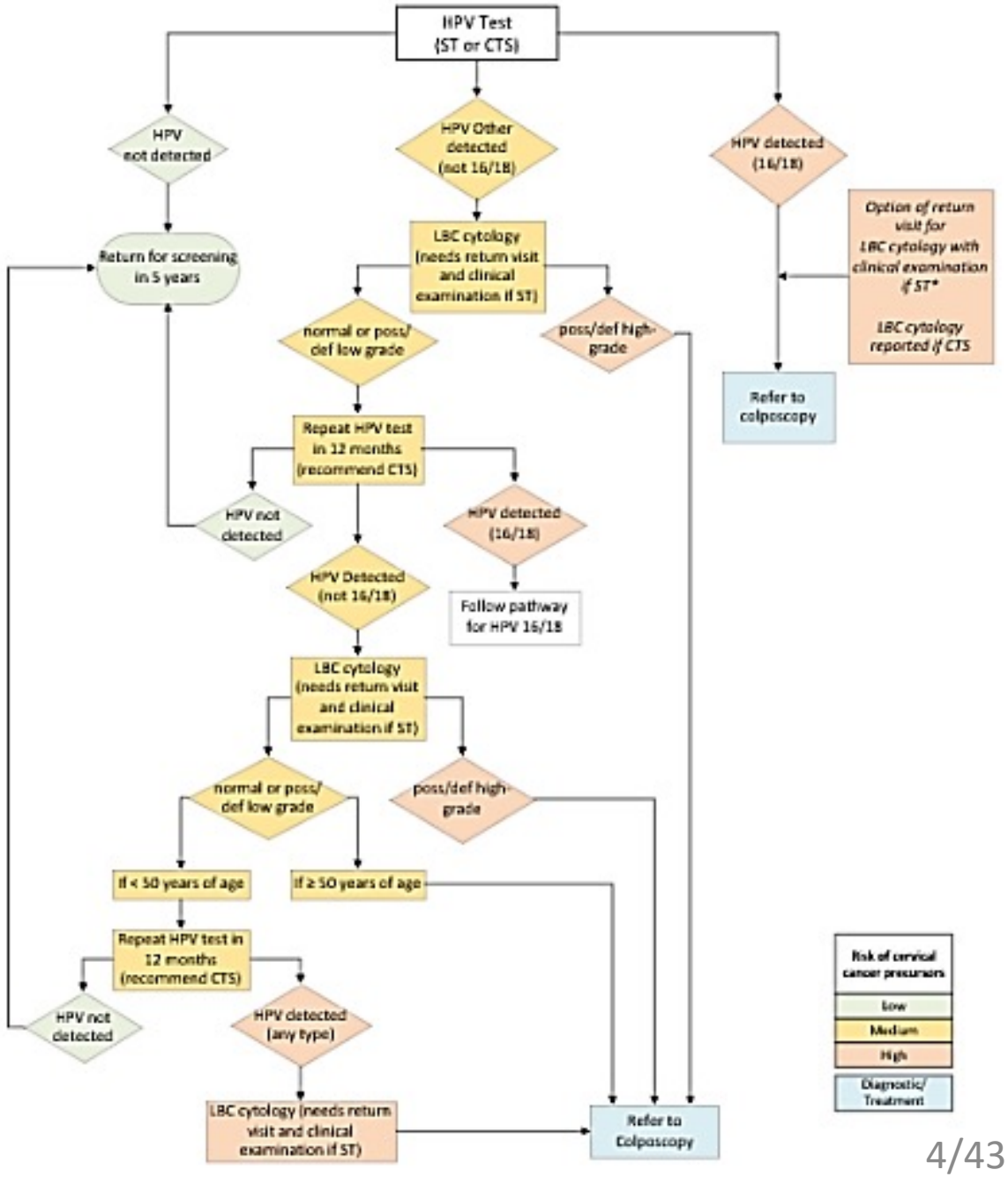
The *Draft Clinical Practice Guidelines for the HPV primary screening era* are under active discussion with primary care/community/public interest groups and are currently out for consultation with colposcopists and laboratories as well.

Algorithm for HPV primary screening for asymptomatic participants

DRAFT ONLY: STILL UNDER CONSULTATION

Has been updated since 2015:

- is becoming increasingly complex
- changes have been made based on feedback from Australia with their experience of introducing HPV primary screening
- self-testing has been introduced
- is currently under consultation so further changes may be made



What changes will happen to work volumes in cytology?

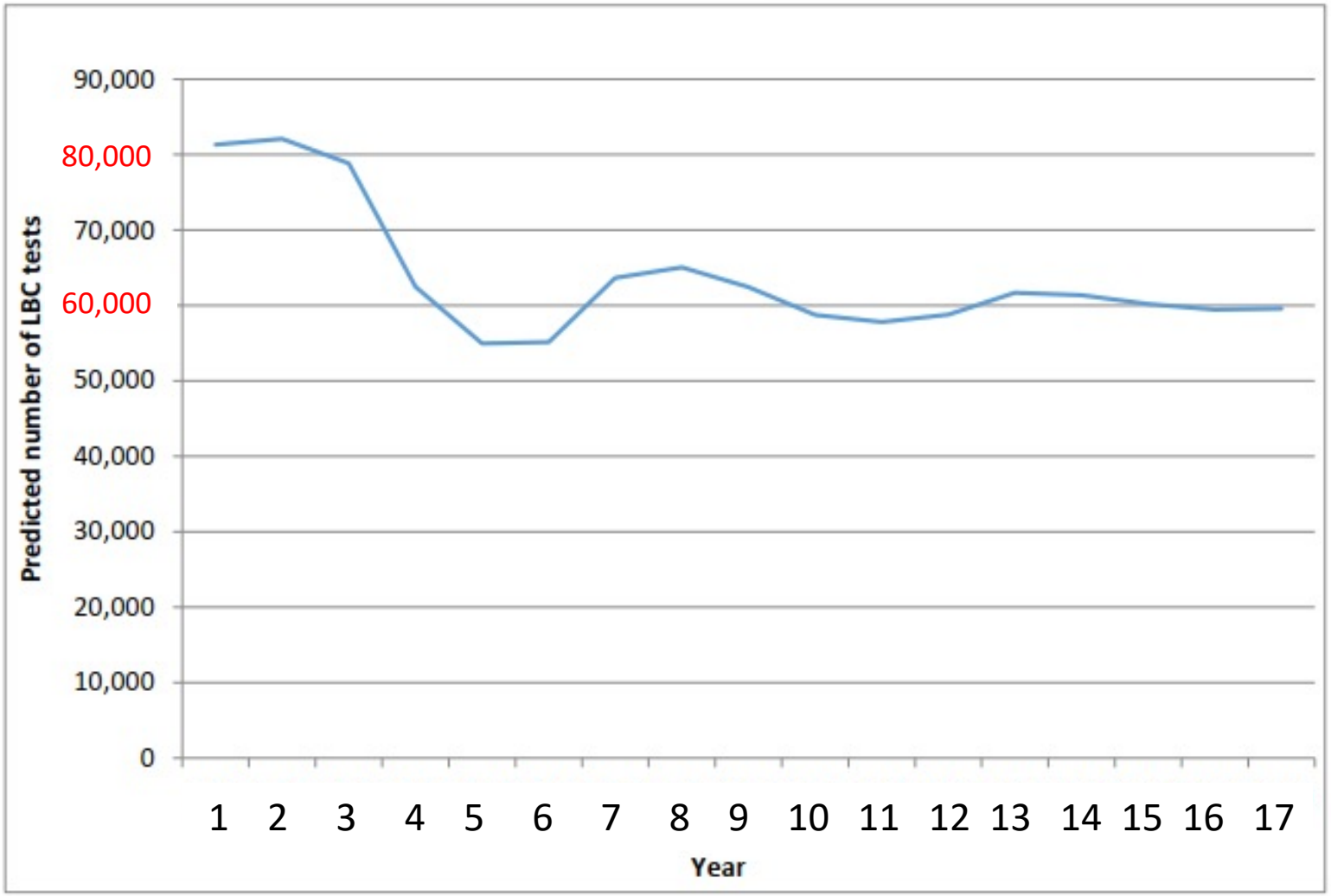
Modelling was carried out in 2016 to predict workloads

This was done prior to the decision to offer self-testing to the whole population

- Self-testing will hopefully appeal to many women who are currently unscreened or underscreened
- The cytology abnormality rate is likely to be higher in this group compared with the well-screened population
- This will hopefully boost screening numbers above the modelling predictions
- This effect will particularly be seen in the first few years of HPV primary screening

What are the predictions for the cytology workload?

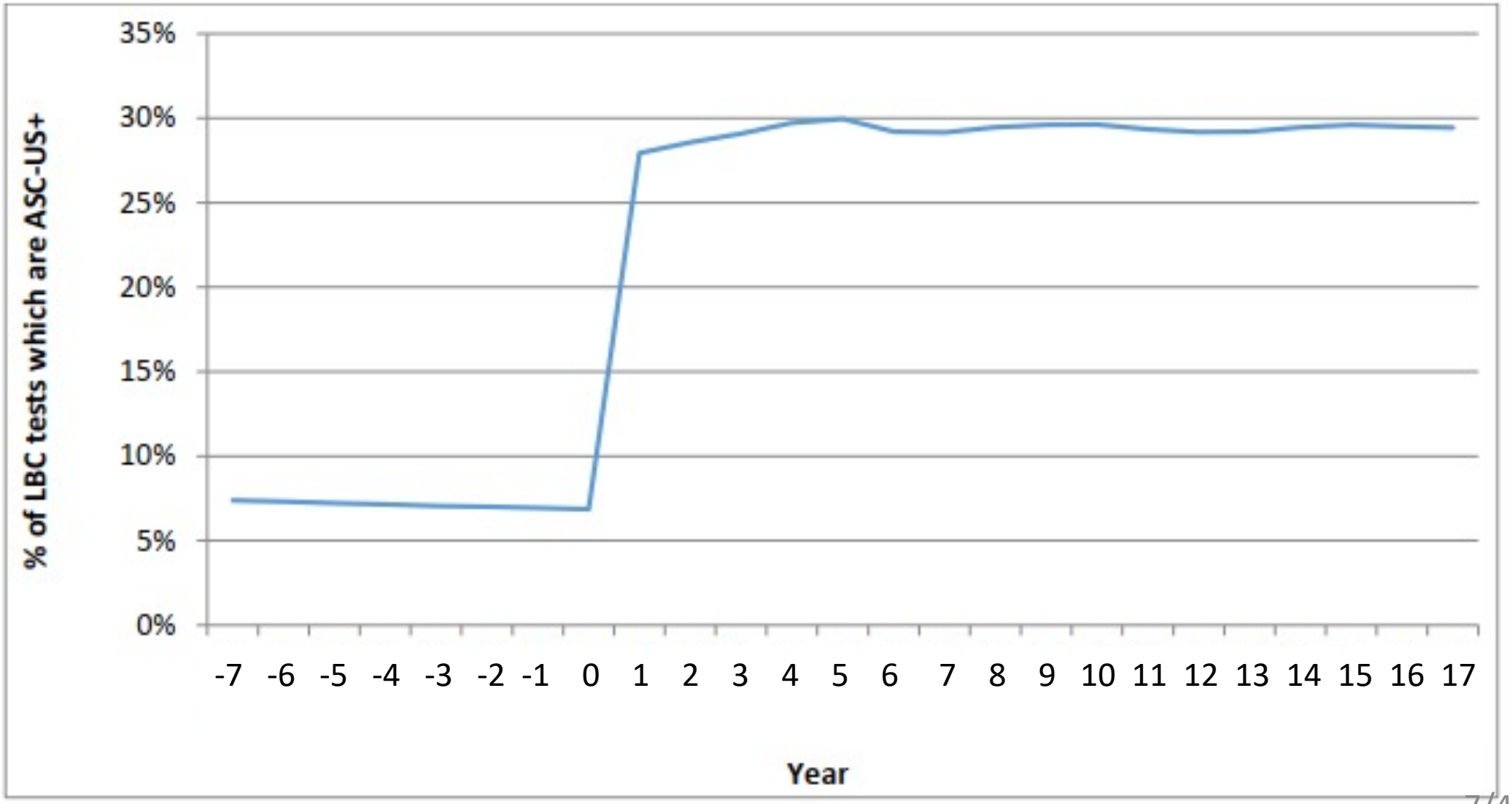
Estimated number of cytology tests per year



Estimated volumes in 2011-2018 range from 415,000 – 426,000 per year

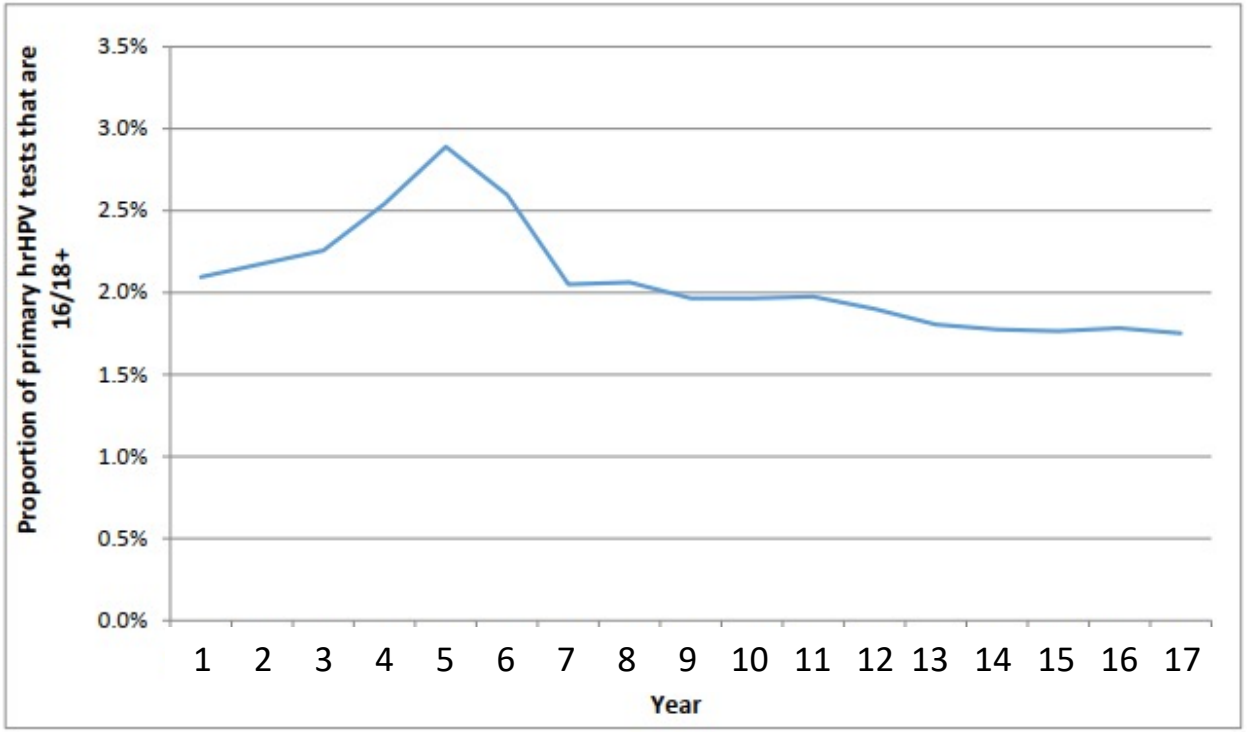
What will the cytology workload consist of?

Estimated percentage of cytology tests that are abnormal (ASC-US+), by year

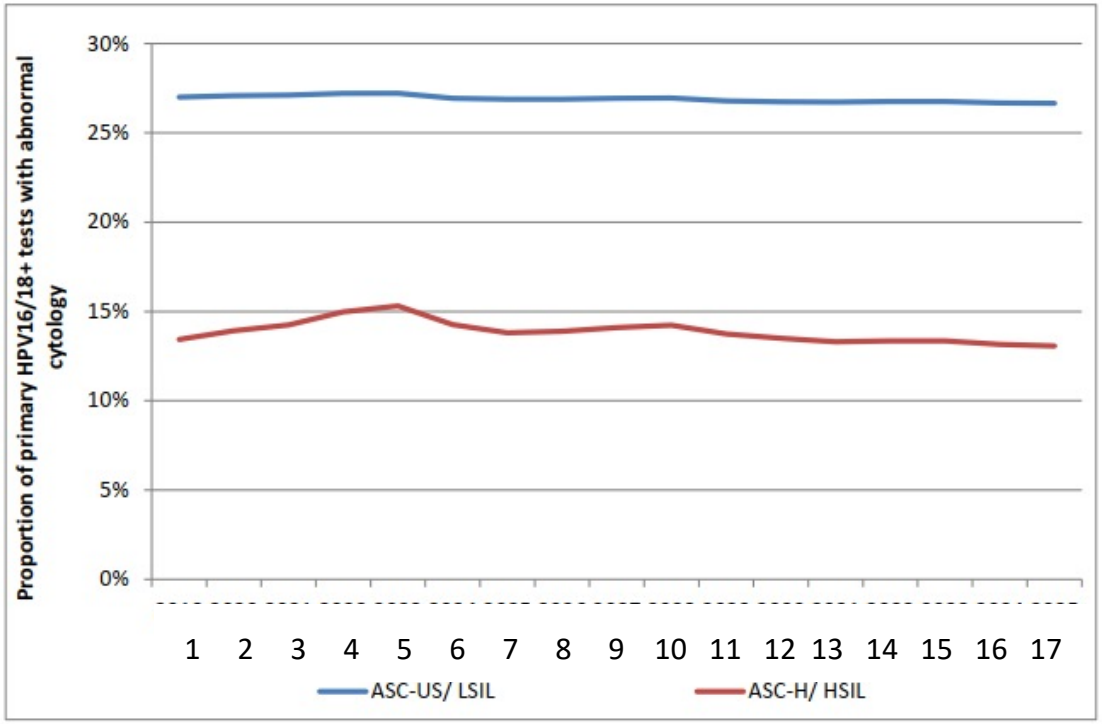


hrHPV 16/18 positive tests

Estimated % of primary hrHPV tests that are HPV16/18 positive, by year

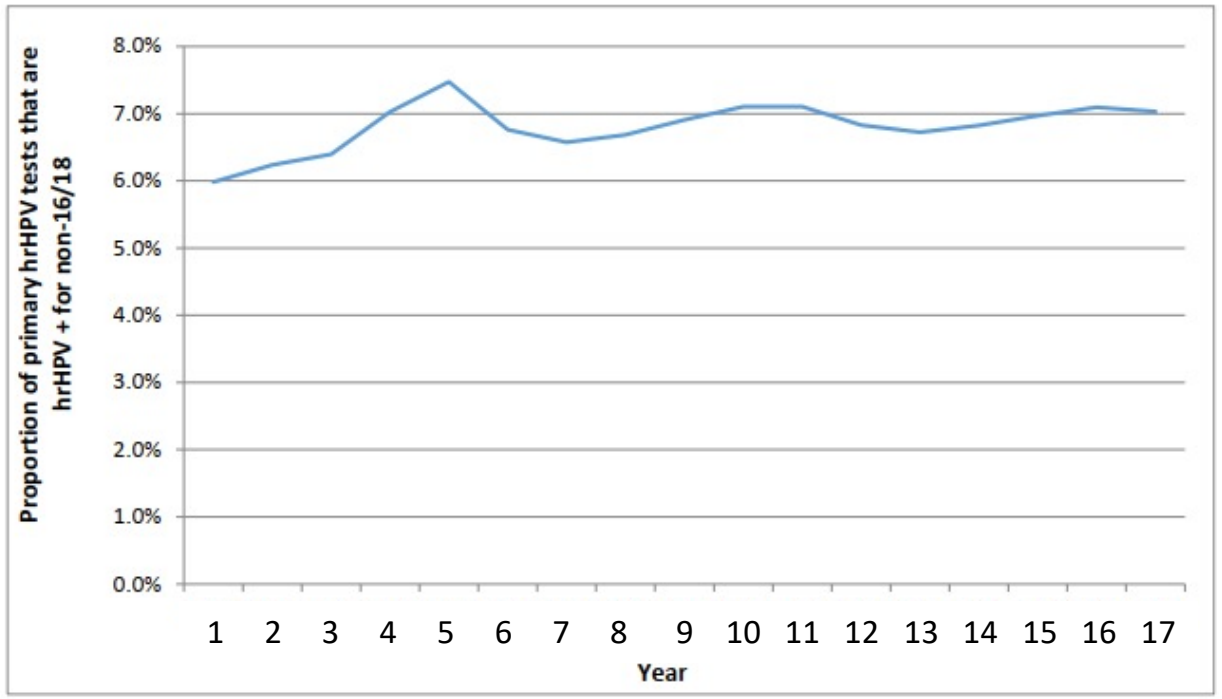


Estimated % of cytology tests done on hrHPV 16/18+ samples, that are abnormal (ASC-US+), by year

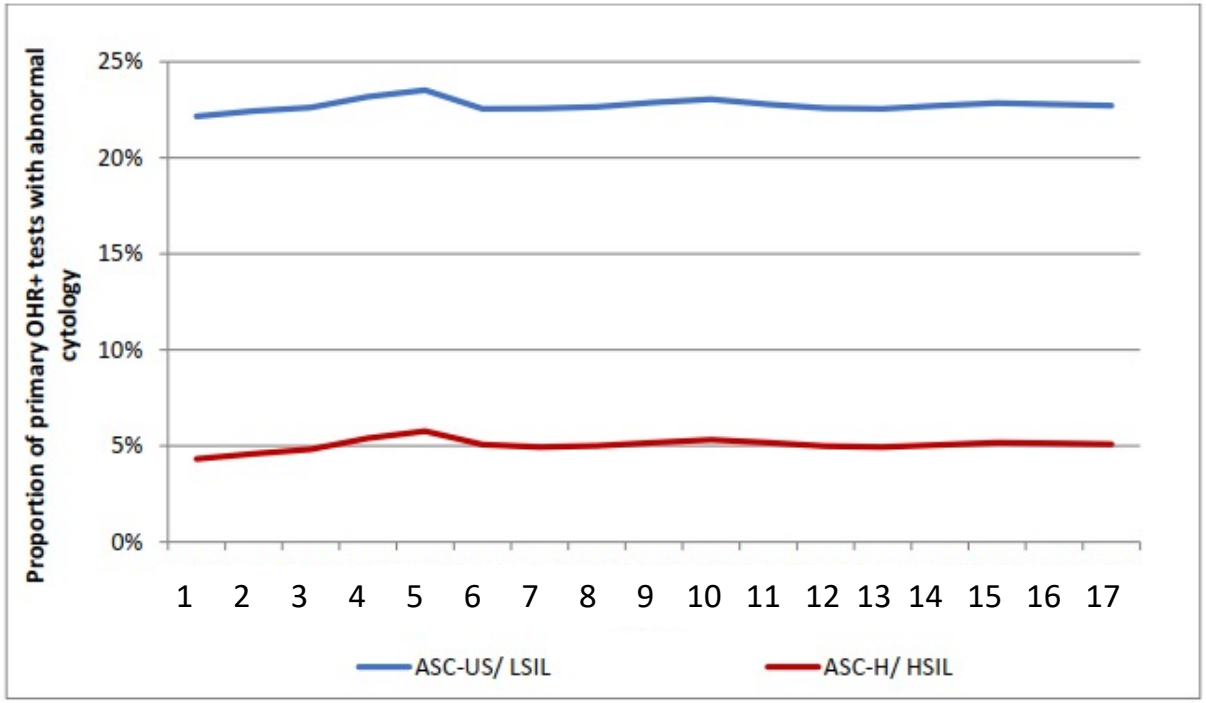


hrHPV Other (non16/18) positive tests

Estimated % of primary hrHPV tests that are hrHPV Other positive, by year



Estimated % of cytology tests done on hrHPV Other+ samples, that are abnormal (ASC-US+), by year



NCSP Policies and Standards Section 5: Providing a laboratory service

NCSP Policies and Standards Section 5 for the current cytology-based programme was updated in May 2021. This version is on the NCSP website at:

https://www.nsu.govt.nz/system/files/page/ncsp-policies-standards-section-5-24march2021_final_for_publication.pdf

Draft NCSP Policies and Standards Section 5 for the HPV Primary screening era was sent to laboratories in May 2021 for consultation.

- comments in this talk are based on the proposals in the Draft
- it is still a draft and there will be changes between now and mid-2023.
- if there is anything that you wish to raise about the proposals, you are welcome to send your comments to me at any time.

Sample Collection

- The name “Sample taker” is likely to change because a significant proportion of cases will be self-collected – we may be talking about “sample requestors” instead.

- Will be looking at the request form – difficult to change but room for improvement

Who will be leading the workforce in cytology?

Lead NCSP Services pathologist: overall responsibility for all NCSP services i.e. cytology, histology and HPV testing

- Lead cytopathologist
- Lead cytoscientist: needs a minimum of 5 years of post-qualification experience

i.e. No change for cytology

What about cytoscientists/cytotechnicians?

There will be a minimum of four cytoscreeners in each laboratory

Reason:

- There is a minimum daily requirement for two cytoscreeners on any one day to report the work
- Four staff allows for one unfilled vacancy and one person to be on sick leave and still have two cytoscreeners to report the work
- These four staff all need to be actively screening and reporting cervical cytology but they don't have to be full time at the laboratory, or to be full time screening cervical cytology

Minimum volume of cytology cases per laboratory per year

- Currently 15,000 per annum

- Will be determined by the NCSP
- Hasn’t been finalised yet – will be announced as part of the procurement process

What will be different in the workflow?

HPV testing will be done on almost all samples

- cytology will be done sequentially or concurrently, if required
- no more checking to see if HPV testing is justified

Someone will need to decide whether cytology will be needed:

- not possible on self-test samples
- almost all HPV-positive LBC samples will have cytology
- cytology may be ordered on the request form e.g. test of cure
- the NCSP history and the clinical context need to be checked to determine other situations where the need for cytology is less obvious and may have been missed by the sample taker

Note: It may be possible for the new register to flag these samples but until it is clear that a flag can be placed on the NCSP record, this will need to be done manually

Standard: Reviewing case documentation to identify samples requiring cytology

The request form and NCSP register history for every sample ….must be reviewed by a suitably competent and registered cytoscientist or cytotechnician who reports cervical cytology, to determine the test requirements.

- Where hrHPV testing is performed, identifying whether cytology is also required must occur prior to the hrHPV test result being released as both results must be released in one report.
- Cytology reporting will be required for some cases where the hrHPV test result is *Not detected*, e.g. Test of Cure samples, women with a previous glandular abnormality, symptomatic women and in some specific clinical circumstances such as immunodeficiency.
    - Symptoms requiring co-testing include suspicious abnormal bleeding including postmenopausal bleeding, an abnormal-appearing cervix and pelvic pain.

The following information must be reviewed…….

- The laboratory request form for evidence of
  - symptoms such as abnormal vaginal bleeding
  - a clinical history of an abnormal-appearing cervix
  - specific clinical circumstances such as immunodeficiency
  - a request for cytology only from a specialist colposcopist or gynaecologist

- The NCSP history for evidence of:
  - a previous glandular abnormality requiring co-testing follow-up
  - previous high-grade squamous histology or cytology requiring a Test of Cure
  - previous high-grade glandular histology or cytology

hrHPV testing without cytology

- HPV-negative samples (where cytology is not indicted for a separate reason)
- Self test HPV-positive swab samples
- a previous recent LBC sample where cyto was reported but HPV test was invalid: repeat for HPV only

Cytology without hrHPV testing

- a sample for cytology following a recent hrHPV: Detected result on a self-test swab sample
- a repeat LBC sample taken after a previous sample where HPV testing was reported but the cytology was unsatisfactory
- a sample taken at colposcopy for cytology where HPV testing is not required

How will the laboratory interact with the new NCSP Register

…watch this space

Cytology screening workflow

Screening will be more intensive because

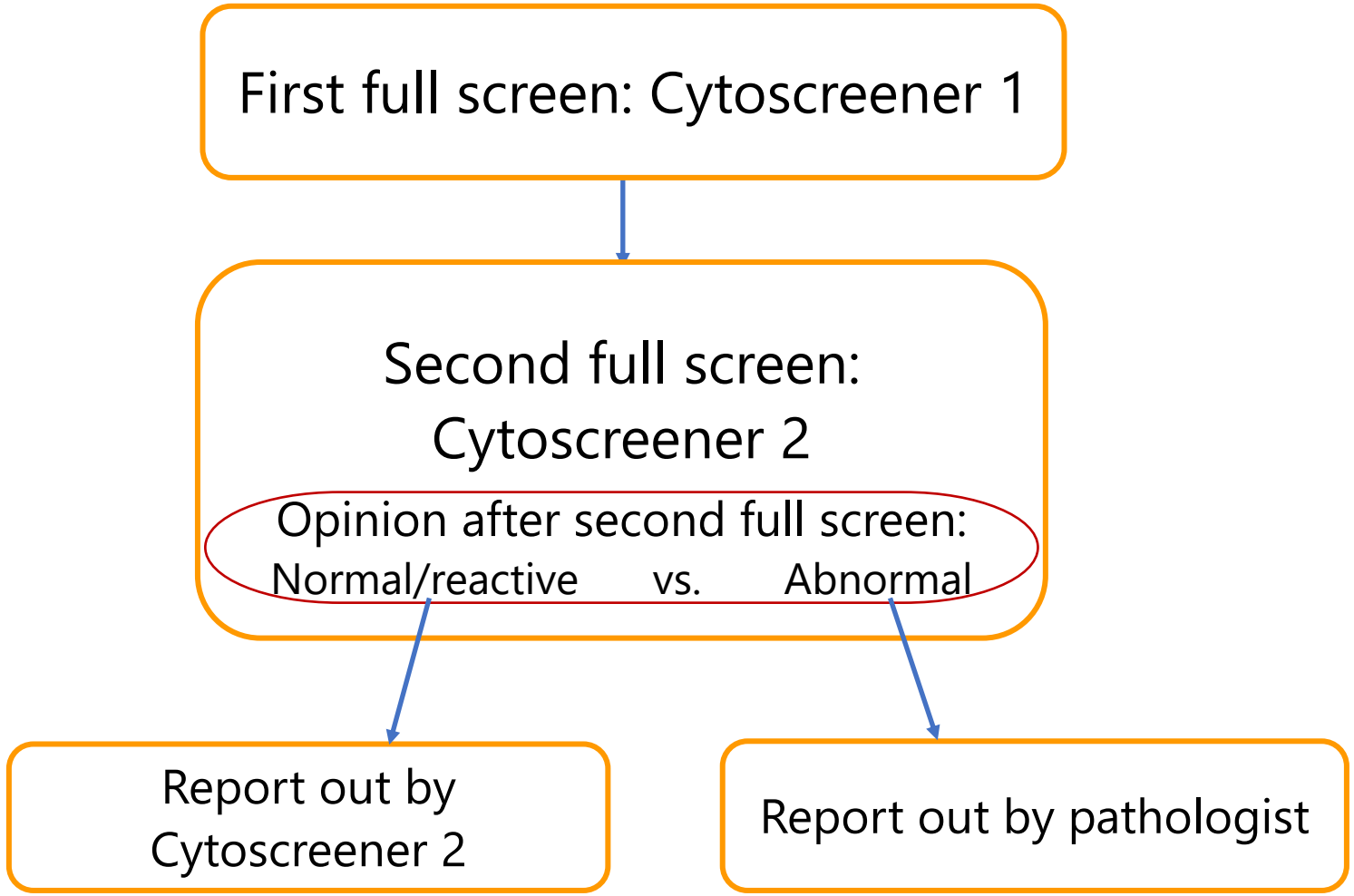
almost every case will be hrHPV positive

- All cases will be seen by two different screeners
- All cytology cases will have a minimum of one FOV screen and one full manual screen
- All cases sent to a pathologist will have two full manual screens

Cytology workflow: Manual screening

All slides will have two full screens by two different screeners

No rapid rescreening



Cytology workflow: Automation-assisted screening

Definitions

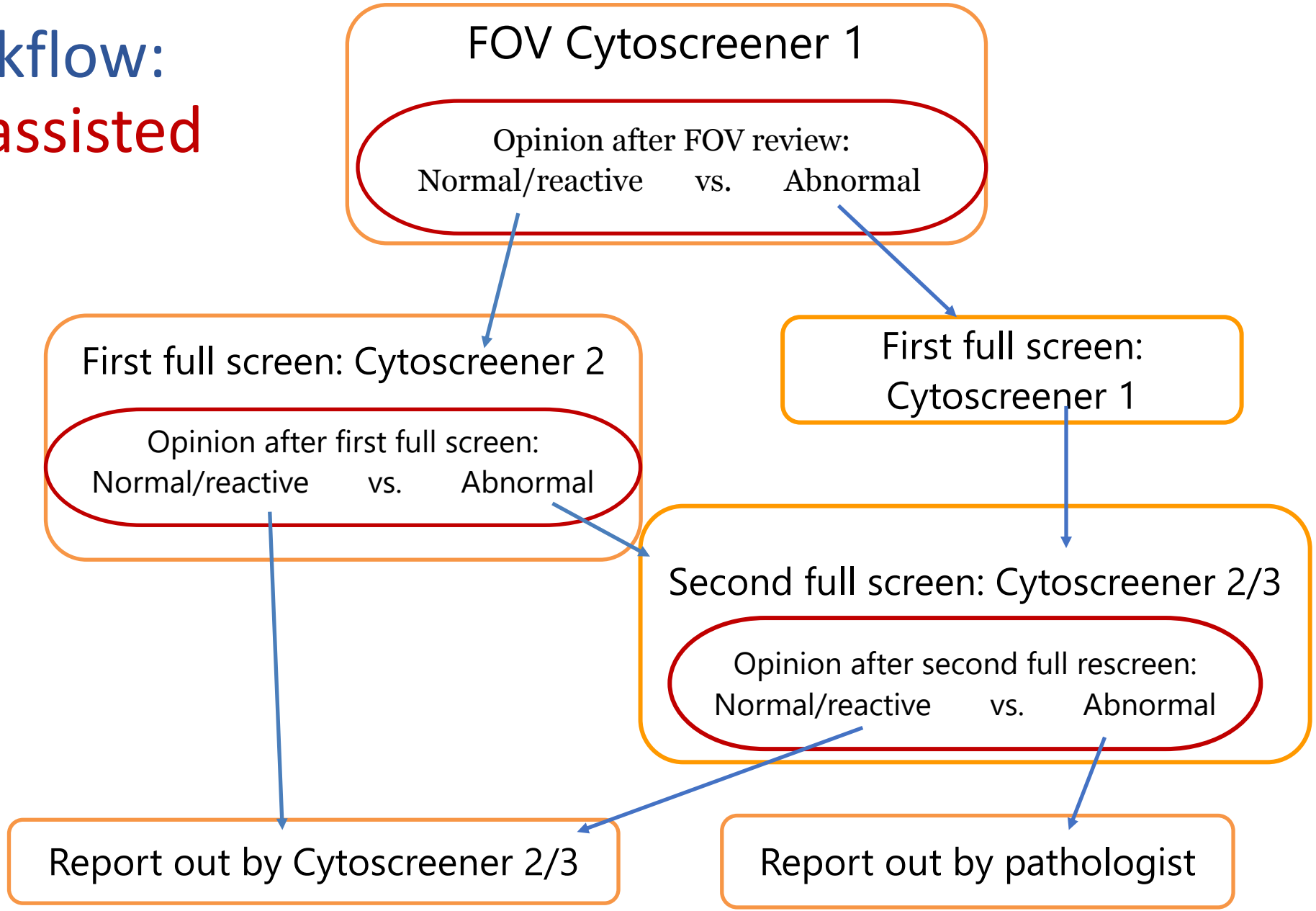
- Field of view (FOV) – Microscopic FOV at x10 objective magnification selected and presented to the cytologist by location-guided technology
- FOV review – The microscopic review of all imager-selected FOVs by a cytoscreener
- First full screen – First full manual screen after FOV review
- Second full screen: A second full manual screen performed after the FOV review with first full screen, is completed. A second full screen will usually be performed because an abnormality has been identified at the first full screen stage.

FOV review with first full screen

- If an epithelial abnormality is identified in a FOV review a full manual screen must be performed. The first full manual screen must be performed by the same cytoscreener who performed the FOV review. A second full manual screen must then be performed by a different cytoscreener who either reports it or sends it to a pathologist.

- If no epithelial abnormality is identified in a FOV review, a full manual screen must still be performed as part of the first screen process. In this case, the full manual screen must be performed by a different cytoscreener from the person who performed the FOV review.

Cytology workflow: Automation-assisted screening



Second full screens

A second full screen must be performed for all who:

1. have abnormal (G2 or G3) gynaecological cytology identified by first full manual screening (where an automated device is not used) or FOV review with full screen.

2. have had a previous low-grade (ASC-US or LSIL) abnormality and have not been returned to five-yearly HPV screening after the low-grade result OR have not had a “Not Detected” hrHPV result since the low-grade cytology result

3. have had a previous high-grade cytologic or histologic abnormality and who:

    i. have not had the high-grade squamous abnormality treated

    ii. have been treated but have not successfully completed a test of cure since treatment and are having any one of the first three cytology samples after treatment

    ii. had a glandular abnormality in the previous five years

5. are overdue for a cervical screening test by more than 5 years

6. have unsatisfactory cervical/vaginal cytology

7. have suspicious clinical conditions, abnormal bleeding or observed cervical abnormalities, or are immune deficient.

Using automated screening devices

- The ThinPrep Imager or the SurePath Profiler are used in all NZ cytology laboratories
- New Zealand labs have accepted that imager-assisted screening is at least as good as manual screening so the main advantage to using the imagers is productivity gains
- decisions about whether to continue using automated screening devices is likely to be made locally

Cytology workloads: daily maximums

Standard: Maximum daily workloads for cytoscreeners (no change)

- The maximum workload for any cytoscreener performing manual or FOV screening (LBC samples) is 70 fully screened slides (or an equivalent workload) on any single working day.
- The maximum times any cytoscreener may spend screening cytology slides is 7 hours 30 minutes (7.5 hours) in any single day, and 45 hours over any consecutive seven-day period.

Calculating workload units

In calculating workloads:

- Two FOV reviews count as one full screen
- One FOV review followed by a full manual screen on the same slide are to be counted separately i.e. 1.5 workload units
- Second full screens and QA slide reviews are counted as one full screen

Maximum number of different cases a single screener could see in a day will be about 90 samples:

90 cases = 45 FOV workloads + 27 for full screen workloads = 72 Workload units

Cytology workloads: annual minimums

Standard: Cytoscientist and cytotechnicians must conduct FOV reviews with full first screens if required (automation-assisted screening) or full first screens (manual screening) on a minimum of 2500 gynaecological LBC samples per annum

- Counting samples here, not workload units, so one sample: FOV review plus one full manual screen counts as one case
- Is a requirement to maintain competency, so applies regardless of the number of FTE's worked or the level of seniority in the department

Workload minimums compared with current practice

	HPV primary screening	Current Practice
Minimum primary screening samples per year	2500	3000
Minimum number of abnormals seen per year	833 (30%)	210 (7%)
For 250 working days per year less 20 for 4 weeks leave = 230	11 samples per day (if working every working day)	13 samples per day

Communicating results: sign out

Reporting hrHPV (only) tests

- Results must be reported in an approved format as either *hrHPV Detected, hrHPV Not detected*, *Invalid*, or *Spoiled for analysis*.
- Where hrHPV is detected, the report must stipulate whether this is HPV 16 and/or HPV 18 and/or HPV "Other" i.e. one or more non-16/18 type(s).
- Molecular scientists/technicians must only sign out reports if:
  - The result is *hrHPV Not Detected* AND the sample is a regular screening sample (i.e. not taken because of a recommendation for early repeat testing at the last event on the NCSP Register) for repeat testing in 5 years AND there is no concurrent cytology being reported.
  - The hrHPV result is *Invalid* or *Spoiled for Analysis* and the recommendation is for repeat testing.

Sign out in cytology

All reports must be released by a pathologist or a cytoscientist/cytotechnician if any of the following apply:

- the result is *hrHPV Detected* including self-test swab samples
- the sample has been taken at an “earlier than 5 years” interval because of a recommendation for early repeat testing (for example a Test of Cure sample or follow up after a previous HPV Detected result)
- the recommendation for the current test is NOT for hrHPV testing in 5 years

Reporting hrHPV and cytology tests (same sample)

Where a hrHPV test and cytology test are performed on the same sample, both test results must be reported to the sample taker/requestor at the same time in one report.

Turnaround times

Standard: Reporting hrHPV tests and gynaecological cytology results to sample takers/requestors

1. Where a hrHPV test is the only NCSP test performed on a sample, the laboratory must report:
   - 100% of hrHPV test results to sample takers within 3 working days of receipt of the sample

2. Where a hrHPV test and a cytology test are performed on the same sample, the laboratory must report:
   - 100% of the completed report containing both the hrHPV test result and the gynaecological cytology result to the sample taker within 10 working days of receipt of the specimen

3. Where a cytology test only is performed on the sample (i.e. without an accompanying hrHPV test), the laboratory must report:
   - 100% of the completed report containing the gynaecological cytology result to the sample taker within 10 working days of receipt of the specimen

Standard: Sending hrHPV-only results to the NCSP Register

Where a hrHPV test is the only NCSP test performed on a sample, the laboratory must report:

- 100% of hrHPV test results to the NCSP Register in the approved format within 4 working days of receipt of the sample. Partial genotyping results identifying the presence of hrHPV 16, hrHPV 18 or hrHPV "Other" (i.e. non16/18) must be included.

Standard: Sending hrHPV with cytology results or cytology-only results to the NCSP Register

- Laboratories must forward to the NCSP Register 100% of all reports, both cytology only and cytology with an hrHPV test result in the approved format and Bethesda coding within 11 working days of receiving the sample.

Histo/cyto correlation reviews

Slide reviews when histology/cytology discrepancies are identified

- Most cases with discrepant cytology and histology results which have clinical management implications, should be reviewed at a Multidisciplinary Meeting (MDM).

- Cases that have not been reviewed at an MDM and that are identified as discrepant must either be referred directly for MDM review, or reviewed first as part of internal quality assurance, with referral to MDM review if discordant results with clinical management implications are confirmed.

Mandatory Histo/cyto reviews

Cytology	Histology	Mandatory reviews	Recommended reviews
ASC-H/HSIL/SCC	LSIL/negative/reactive	Yes	_
AG1/AG3/AG4/AG5 AIS/AC1-AC5	Negative/reactive	Yes	_
Unsatisfactory/negative	HSIL/invasive SCC/glandular abnormalities/invasive adenocarcinoma	Yes	_
ASC-US/LSIL/AIS	HSIL/invasive SCC	_	Yes
AGC/ASC-US/LSIL/HSIL	Glandular abnormality/invasive adenocarcinoma	_	Yes

Retrospective reviews (42-month look-backs)

The 42-months timeframe for retrospective cytology reviews will be retained for the first three years after introduction of HPV primary screening. The timeframe will be reviewed after three years, to consider the longer screening interval of 5 years with HPV primary screening.

- Draft Section 5 for the HPV primary screening era

What will stay the same?

1. Diagnosing an abnormality in cytology will be the same
2. Educational requirements
3. QA requirements

4. Cytopathologists will continue to operate in much the same way – reporting cytology, running MDM meetings etc. Their work will be impacted much more by immunisation over time, rather than the introduction of HPV primary screening.
   Increased requirement to see 750 cases each rather than 500 annually

5. Histology including TATs (SNOMED coding reviewed or replaced)

Monitoring Indicators: will be reviewed

Indicator L1: Number of samples reported by laboratory in the following categories as a percentage of all satisfactory samples:

- Negative for intraepithelial lesion or malignancy (TBS G1) = Not more than 96 percent reported as negative
- HSIL (TBS HS1+HS2) = not less than 0.5 percent reported as HSIL
- Total abnormalities (TBS G2 and G3) = Not more than 10 percent reported as total abnormalities.

Indicator L2: False negative rate

- Not currently in use.

Indicator L3: Unsatisfactory samples by laboratory

- The number of LBC samples by laboratory reported as unsatisfactory (TBS UA-UG) is not less than 0.1 percent and not more than 3.0 percent.

Indicator 4: Accuracy of cytology reports predicting HSIL/SCC on histology

- Target for PPV for HSIL/SCC = 65–85 percent.

Indicator 5: Accuracy of negative cytology reports

- For women with a histological diagnosis of CIN2, CIN3, invasive SCC, AIS or invasive endocervical adenocarcinoma, the proportion of cytology slides originally reported within the preceding 42 months as negative, benign/reactive or unsatisfactory that on review are consistent with:
  - HS1, HS2, SC, AIS or AC1-5 = not more than 10 percent combined
  - ASC-H, HS1, HS2, SC, AG4-5, AIS or AC1-5 = target of less than 15 percent, but not more than 20 percent combined.

Challenges for cytoscientists/cytotechnicians

1. Adjusting to the transition
2. Becoming familiar with a new NCSP Register
3. Learning about new algorithms and Clinical Practice Guidelines
4. Maintaining the workforce: new cytoscientists will be needed, albeit in smaller numbers

Managing through the uncertainties of the procurement process

So how will life change for a cytoscientist/cytotechnician practising in the HPV primary screening era?

Screening cytology cases will still be the same but there will be:

- more intense screening per case than at present
- the abnormality rate will be significantly higher so this will take more time: productivity per screener may be less
- reviewing request forms with NCSP histories to determine who need cytology will be a new task for cytoscreeners (unless this can be achieved through NCSP Register flags)
- algorithms to determine report recommendations will be more complex
- sign out will be split across HPV testing and cytology

It will be a more complex and more challenging job but hopefully more interesting too

Cytologists will continue to make a significant contribution to preventing women from developing invasive cervical cancer in New Zealand