PEJABAT TIMBALAN KETUA PENGARAH KESIHATAN (PERUBATAN)
KEMENTERIAN KESIHATAN MALAYSIA
ARAS 7, BLOK E1, KOMPLEKS E
PUSAT PENTADBIRAN KERAJAAN PERSEKUTUAN
62590 PUTRAJAYA

TEL : 03-88831142
FAX : 03-88831155

Ruj. Kami:KKM.600-27/4/2 Jld.2 (2)
Tarikh : 9 Disember 2016

SEPERTI SENARAI EDARAN

YBhg. Datuk/Dato'/Datin/Tuan/Puan,

PENAMBAHBAIKAN *"GUIDELINE ON STANDARDIZATION OF WORKLOAD DATA COLLECTION 4TH EDITION 2016"*

Dengan segala hormatnya saya merujuk kepada perkara di atas dan surat rujukan KKM.600-27/4/2 (15) bertarikh 30 Jun 2016 adalah berkaitan.

2. Untuk makluman YBhg. Datuk/Dato'/Datin/Tuan/Puan, Bengkel Beban Kerja Patologi telah pun berjaya diadakan pada 22 Ogos 2016 di Institut Kanser Negara, Putrajaya. Bengkel ini telah dihadiri oleh wakil-wakil makmal Patologi hospital-hospital KKM, makmal-makmal Kesihatan Awam dan juga Institusi-Institusi KKM seperti Pusat Darah Negara dan Institut Penyelidikan Perubatan.

3. Susulan daripada bengkel tersebut, terdapat beberapa penambahbaikan telah dilakukan terhadap garis panduan ini. Sehubungan dengan itu, diharapkan garis panduan yang telah ditambah baik ini dapat digunapakai oleh semua makmal di hospital, kemudahan kesihatan awam dan institusi lain yang berkaitan dalam Kementerian Kesihatan Malaysia (KKM).

4. Garis panduan yang telah ditambah baik ini boleh didapati di laman sesawang Perkhidmatan Patologi (*www.patologi.gov.my*) dan laman sesawang KKM bagi rujukan YBhg. Datuk/Dato'/Datin/Tuan/Puan. Sebarang pertanyaan mengenai garis panduan tersebut boleh diajukan kepada YBhg. Datin Dr. Nik Noraihan binti Nik Mustapha, Hospital Sultanah Bahiyah, Kedah di talian 04-740 6799 / 6774 atau nikraihan@kdh.moh.gov.my.

5. Segala kerjasama YBhg. Datuk/Dato'/Datin/Tuan/Puan di dahulukan dengan ucapan terima kasih.

Sekian.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

DR. ABDUL KADIR BIN SALLEH
(MMC:26588)
Pengarah Amalan Perubatan
Bahagian Amalan Perubatan
Kementerian Kesihatan Malaysia

Bp.

(DATUK DR. JEYAINDRAN TAN SRI SINNADURAI)
Timbalan Ketua Pengarah Kesihatan (Perubatan)
Kementerian Kesihatan Malaysia

s.k.:

Ketua Pengarah Kesihatan
Kementerian Kesihatan Malaysia

Ketua Perkhidmatan Patologi Kebangsaan

SENARAI EDARAN

Pengarah Jabatan Kesihatan Negeri Perlis

Pengarah Jabatan Kesihatan Negeri Kedah

Pengarah Jabatan Kesihatan Negeri Pulau Pinang

Pengarah Jabatan Kesihatan Negeri Perak

Pengarah Jabatan Kesihatan Wilayah Persekutuan Kuala Lumpur / Putrajaya

Pengarah Jabatan Kesihatan Negeri Selangor

Pengarah Jabatan Kesihatan Negeri Negeri Sembilan

Pengarah Jabatan Kesihatan Negeri Melaka

Pengarah Jabatan Kesihatan Negeri Johor

Pengarah Jabatan Kesihatan Negeri Pahang

Pengarah Jabatan Kesihatan Negeri Terengganu

Pengarah Jabatan Kesihatan Negeri Kelantan

Pengarah Jabatan Kesihatan Negeri Sarawak

Pengarah Jabatan Kesihatan Negeri Sabah

Pengarah Jabatan Kesihatan Wilayah Persekutuan Labuan

Pengarah Hospital Kuala Lumpur

Pengarah Institut Kanser Negara

Pengarah Pusat Darah Negara

Pengarah Institut Perubatan Respiratori

Pengarah Institut Penyelidikan Perubatan

Pengarah Makmal Kesihatan Awam Kebangsaan

Pengarah Makmal Kesihatan Awam Ipoh

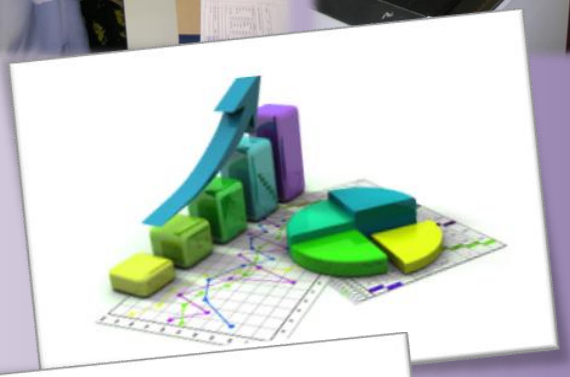
Pengarah Makmal Kesihatan Awam Johor Bahru

Pengarah Makmal Kesihatan Awam Kota Bharu

Pengarah Makmal Kesihatan Awam Kota Kinabalu

Timbalan Pengarah Pusat Informatik Kesihatan

GUIDELINE ON STANDARDIZATION OF WORKLOAD DATA COLLECTION 4th EDITION 2016



PATHOLOGY SERVICES

MINISTRY OF HEALTH MALAYSIA

GUIDELINE ON
STANDARDIZATION OF WORKLOAD DATA COLLECTION
4th EDITION - 2016

CONTENT

1. INTRODUCTION

Workload of Pathology services forms the basis to assist Ministry of Health (MOH) Malaysia in planning for resource management (e.g. manpower, budget and equipment), policy decisions, as well as monitoring the utilization of pathology services.

The first guideline on workload calculation and data collection was published in 1999. A few discrepancies in and alterations to the first edition led to issuance of the 2nd and 3rd editions in quick succession (August 2000 and January 2002, respectively). The 3rd edition guideline has since been used by laboratories in Ministry of Health (MOH) hospitals and health clinics. Since then, there has been marked progression in the range of tests offered, as well as laboratory testing methodologies, especially from manual to automation. In 2009, an attempt was made to revise and update the guideline in data collection. However, the draft of the revised guideline that was produced then did not get to be endorsed due to technical issues.

In 2014, an initiative was again made to revise and update the existing guideline and the process continued through in 2015. An initial meeting was held in August 2014 to discuss on this matter, which was chaired by the Head of Pathology Services and attended by representatives from individual Pathology disciplines from hospital laboratory services, as well as from Institute for Medical Research (IMR), National Blood Centre *(Pusat Darah Negara*, PDN), National Public Health Laboratory (*Makmal Kesihatan Awam Kebangsaan*, MKAK*), Bahagian Pembangunan Kesihatan Keluarga* (BPKK) *and Pusat Informatik Kesihatan* (PIK). It was agreeable during this meeting that the draft document on the revised guideline on workload data collection, which was produced in 2009 needed further updating due to expansion of test lists and methodologies. In addition, the format of workload submission also needed to be revised to allow more detailed, representative and informative workload reporting.

Finally, the current updated guideline was developed to ensure that data collection is conducted in a standardised manner by all laboratories in hospitals, public health facilities and other relevant institutions within MOH.

2. REVIEW OF DATA COLLECTION PRINCIPLES AND REPORTING FORMAT

Workload is represented by number of tests performed, as defined by and unique to an individual discipline. Data generated should be logical, meaningful and useful for a particular discipline. In certain laboratories/pathology disciplines, extensive automation has taken place, whilst in others, some components of manual testing are still indispensible. Method of data calculation and collection for one particular discipline should not be literally compared to another discipline, especially in terms of number of tests generated. As much as possible, multiplication factor is avoided in calculating number of tests to prevent potential irregularities in data collection. Data collected should, among others, allow some reflection on the resources (namely budget and manpower) needed in running an individual laboratory. To assist that, in addition to number of tests, data are also collected in the forms of group of tests and number of specimens.

Standardised discipline-specific soft copy excel forms (*Borang Beban Kerja Bulanan* 1/2016 - *Patologi Anatomik / Hematologi / Patologi Kimia / Mikrobiologi Perubatan*) for granular workload data collection had been prepared to ease the data collection, calculation and submission process. National Pathology Workload Committee needs to be directly informed to fascilitate addition of tests that are not yet listed and need to be included in the test lists.

To accommodate the changes in the format of workload data collection, additional discipline-specific forms, *Borang Ringkasan Beban Kerja 1/2016 - Patologi Anatomik / Hematologi / Patologi Kimia / Mikrobiologi Perubatan,* had also been created to enhance workload data reporting within the Pathology services. These forms allow data to be recorded according to test groups. It is also in excel format and is auto-filled, in tandem with data collection/recording activity using discipline-specific *Borang Beban Kerja Patologi Bulanan* 1/2016. The *PER-SS 206 – Pin 1/2000* form will continue to be used for monthly workload reporting to MOH.

3. SCOPE OF DOCUMENT

This guideline is applicable for use by diagnostic laboratories dealing with human samples, within the Ministry of Health, Malaysia. Such laboratories include:

- 3.1 Hospital laboratories
- 3.2 Health Clinic laboratories
- 3.3 Institutes and agencies, which include:
  - 3.3.1. Institute for Medical Research (IMR)
  - 3.3.2. National Blood Bank Centre (*Pusat Darah Negara,* PDN)
  - 3.3.3. National Cancer Institute (*Institut Kanser Negara,* IKN)
  - 3.3.4. Institute of Respiratory Medicine (*Institut Perubatan Respiratori,* IPR)
  - 3.3.5. Women and Children Hospitals (WCH)
- 3.4 Public Health Laboratories:
  - 3.4.1 National Public Health Laboratory (*Makmal Kesihatan Awam Kebangsaan,* MKAK)
  - 3.4.2 Regional Public Health Laboratories (*Makmal Kesihatan Awam,* MKA)

4. NATIONAL PATHOLOGY WORKLOAD COMMITTEE

4.1 Data collection and minding is under the perview of National Pathology Workload Committee (*Jawatankuasa Beban Kerja Patologi Kebangsaan*).

4.2 Data collection and minding activities include but not limited to:

- 4.2.1 Six-monthly compilation of granular and aggregate workload data, which are received from state pathologists, institutes and agencies, as well as MKAK.
- 4.2.2 Annual reporting on national pathology workload data. This is to aid the National Head of Pathology Services (*Ketua Perkhidmatan Patologi Kebangsaan*) and Heads of Pathology Disciplines in making annual report on pathology services, as well as for purpose of continuous service and activity planning.

4.3 The committee consists of:

4.3.1 Chairman (Pathologist)

4.3.2 Vice Chairman (Pathologist)

4.3.3 Representatives from each pathology discipline i.e. Anatomic Pathology, Chemical Pathology, Haematology and Medical Microbiology

4.3.4 Representatives from institutes, agencies and departmental laboratories, which include IMR, PDN, IPR, IKN and Molecular and Cytogenetic Laboratory of Hospital Kuala Lumpur.

4.3.5 Representatives from *Bahagian Pembangunan Kesihatan Keluarga* (BPKK).

4.3.6 Representatives from National and Regional Public Health Laboratories (MKAK and MKA).

5. GENERAL PRINCIPLES OF DATA COLLECTION

5.1 Only tests performed by individual laboratories are considered as their true workload.

5.2 Data on outsourced and referred tests are to be separately collected and recorded. This will give some information on the pre-analytical manpower involved in specimen preparation prior to sending out to external laboratories. Workload on outsourced and referred tests will also be useful in policy making and planning for centralization or decentralization of services.

Note:

i. Referred samples/tests - Apply to samples sent to MOH laboratories or other centres, which do not incur extra cost to the primary/referring laboratory.

ii. Outsourced samples/tests - Apply to samples sent to private laboratories or other centres and the primary/outsourcing laboratories are charged for the services rendered.

5.3 Only tests performed on patient's specimens are included in the workload. Internal Quality Control (IQC) and External Quality Assurance (EQA) tests are excluded.

5.4 There may be some tests that are performed by more than one discipline in different hospital settings, either by tradition or by default of where the instrument/analyser is placed. Examples of such tests include CRP, C3, C4, IgG, IgA and IgM, which are done either in Chemical Pathology or Serology/Immunology laboratories. In principle, "ownership" of tests by individual discipline should take into consideration the technical and consultancy accountability.

5.5 Clerical work (e.g demography and typing) and result validation are not included in workload collection.

5.6 Workload on 'non-test' technical activities may be separately collected and recorded to allow some reflection on pre-analytical manpower and other resources involved. Such

activities include media preparation for microbiological culture and cytogenetic testing. Recording of this workload utilises a separate excel sheet in individual discipline's *Borang Beban Kerja Patologi Bulanan* and *Borang Beban Kerja Patologi Negeri.* Data generated is not included as part of workload submission to MOH.

5.7. The personnel responsible for providing data on workload may either be a Science Officer or a Medical Laboratory Technologist (MLT) in charge. Head of Department/Officer in charge is responsible to verify the generated data.

5.8. All MOH laboratories are to report their monthly aggregate workload data to Ministry of Health using *PER-SS 206 (Pin. 1/2000)* form, through existing channels (see section on preparation and submission of reports below).

5.9 All hospital laboratories are also to submit detailed, as well as summarised workload data to their respective State Pathologists on monthly basis. The State Pathologists will in turn, compile these data and submit them biannually to the National Pathology Workload Committee (see section on preparation and submission of reports below).

5.10 State Pathologist is responsible to verify and monitor data sent to MOH from all laboratories within the state.

6. PREPARATION & SUBMISSION OF REPORTS

6.1 Monthly Reports

6.1.1 Verified workload data shall be submitted to Ministry of Health by 15th day of the subsequent month, using *PER-SS 206 (Pin. 1/2000)* form, through existing channels (refer Diagram 1 on Workload Data Submission).

6.1.2 *Jabatan Kesihatan Negeri* shall compile and submit workload data for the state to Ministry of Health, also using *PER- SS 206 (Pin. 1/2000)* form.

6.1.3 In addition, hospital laboratories shall submit workload data in soft copy to State Pathologists, by 15th day of subsequent month using the following forms:

i. Discipline-specific *Borang Beban Kerja Patologi Bulanan 1/2016*
ii. Discipline-specific *Borang Ringkasan Beban Kerja Patologi 1/2016*

6.2 Biannual Reports

6.2.1 State Pathologists shall submit 6-monthly workload data for all hospitals in their states, using discipline-specific *Borang Beban Kerja Patologi Negeri 1/2016* and *Borang Ringkasan Beban Kerja Patologi 1/2016* to National Pathology Workload

Committee, by 30th July for January - June data and 31st January of the following year for January - December data.

6.2.2 Institutes and agencies, as well as, *MKAK* shall submit their workload data, using *Borang Ringkasan Beban Kerja Patologi* 1/2016 to National Pathology Workload Committee by 30th July for January - June data and 31st January of the following year for January - December data.

6.2.3 *MKA* shall submit their workload data to *MKAK* using *Borang Ringkasan Beban Kerja Patologi 1/2016* by 30th July for January - June data and 31st January of the following year for January - December data.

6.3 Annual Reports

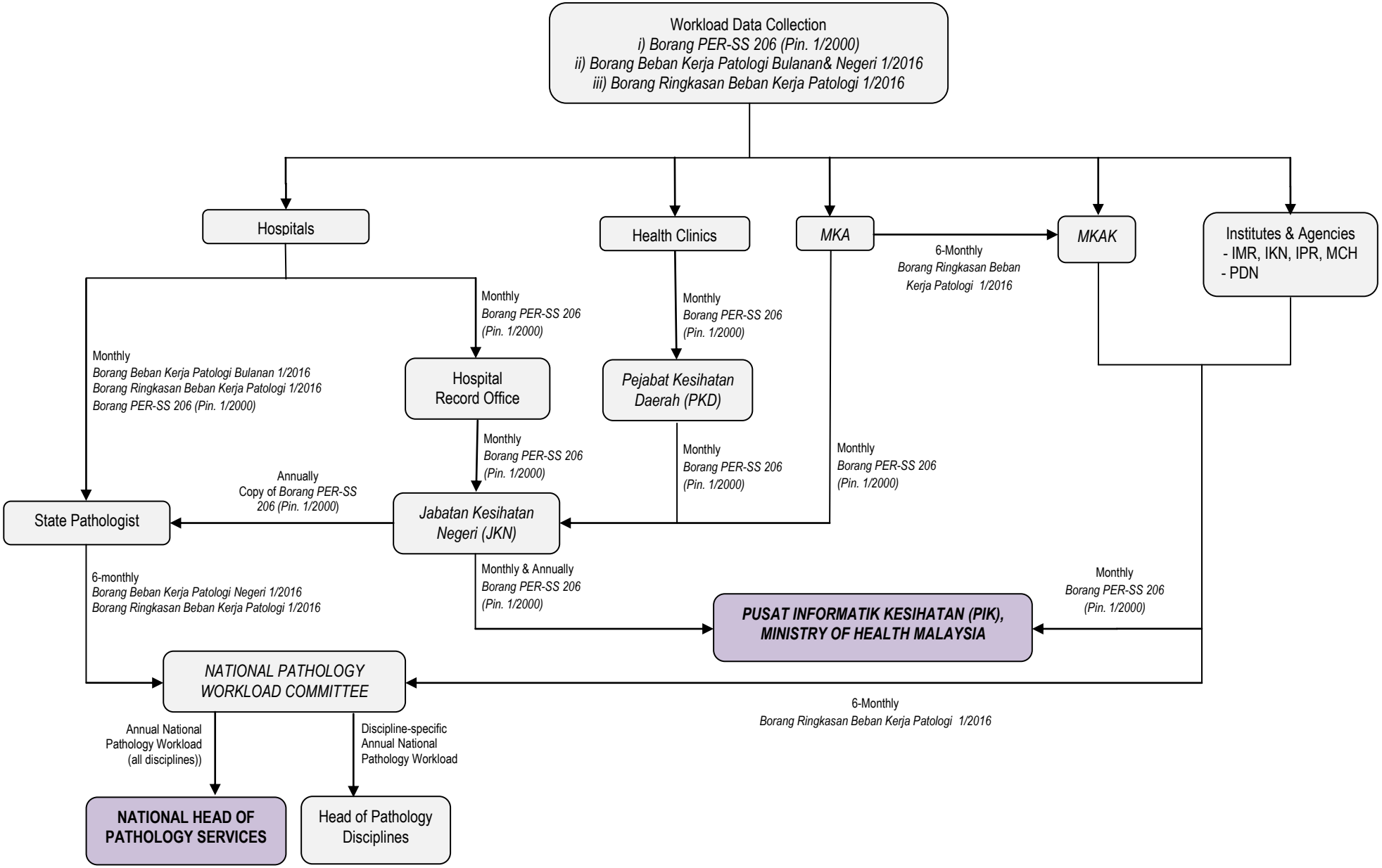
6.3.1 *Jabatan Kesihatan Negeri* shall compile and submit annual workload data for the state to PIK, Ministry of Health, also using *PER-SS 206 (Pin. 1/2000)* form. In addition, a copy shall be given to State Pathologist.

6.3.2 National Pathology Workload Committee shall compile workloads submitted by State Pathologists, Institutes, Agencies and MKAK into Annual National Pathology Workload. Information shall be made available to the National Head of Pathology Services (*Ketua Perkhidmatan Patologi Kebangsaan*).

6.3.3 Detailed workload data for individual discipline (for hospital laboratories) will also be given to the respective Head of Disciplines.

6.3.4 Formal requests for data by other parties will be entertained subject to approval by the National Head of Pathology Services, and where appropriate, by the Director General of Health.

DIAGRAM 1: WORKLOAD DATA SUBMISSION



HEALTH MANAGEMENT INFORMATION SYSTEM

MINISTRY OF HEALTH, MALAYSIA

REPORT OF LABORATORY WORKLOAD: IN-PATIENT / OUT-PATIENT

FOR THE MONTH:_____ YEAR :_____

Location of General, District Hospital, Institutions and Public Health Facilities	Biochemistry	Microbiology	Haematology	Histopathology	Cytology	Forensic	Total	Level of Laboratory
1	2	3	4	5	6	7	8	9
TOTAL								

Tanda Tangan Ketua Jabatan

7. CALCULATION AND RECORDING OF WORKLOAD DATA

7.1 ANATOMICAL PATHOLOGY

7.1.1 Workload data collection is assisted by using several pre-prepared worksheets (see subsequent section).

7.1.2 Workload reporting in Anatomical Pathology involves:

7.1.2.1 Monthly submission of aggregate Histopathology and Cytopathology workload data to MOH, via existing channel, using *Borang PER-SS 206 (Pin. 1/2000).*

7.1.2.2 Monthly submission of detailed (granular), as well as, summarised Histopathology and Cytopathology workload data to State Pathologist, using soft copy *'Borang Beban Kerja Patologi Bulanan 1/2016-Patologi Anatomik'* and '*Borang Ringkasan Beban Kerja Patologi 1/2016- Patologi Anatomik',* respectively.

7.1.2.3 Six-monthly submission of specimen complexity data to State Pathologist using additional pre-prepared soft copy sheet, as part of *'Borang Beban Kerja Patologi Bulanan 1/2016-Patologi Anatomik'*.

7.1.2.4 Six-monthly submission of data on individual pathologist's workload to State Pathologist using additional pre-prepared soft copy sheet, also as part of *'Borang Beban Kerja Patologi Bulanan 1/2016-Patologi Anatomik '*.

7.1.3 State pathologists are to biannually submit data on detailed Histopathology and Cytopathology workload, specimen complexity and individual pathologist's workload to National Pathology Workload Committee, using *'Borang Beban Kerja Patologi Negeri 1/2016 – Patologi Anatomik'.*

7.1.4 Categorisation of specimen complexity shall be based on 'Histopathology Specimen Complexity Guide' provided in this guideline. Laboratories are advised to use own clinical discretion/judgement in categorising specimens that may not be listed.

7.1.5 Individual pathologist's workload shall take into account cases that are co-reported/co-verified by more than one specialist.

7.1.6 A case is defined as one or more specimens belonging to one patient that is/are registered and given one unique laboratory identifier number. Each case registered is counted as one. If there are more than one specimen received for one case, each specimen is counted as one and the total number of specimens is separately recorded.

7.1.7 Second opinion (referral) cases are those that are received for consultation, including those requested by local clinicians (e.g. for review by in-house pathologists prior to initiation of chemotherapy). Workload for cases that are received for special or

immunohistochemical staining assistance are counted under "Specialised tests" section.

7.1.8 If only pre-stained slides are received for cases for second opinion, workload is captured by number of cases only. If paraffin blocks are received and additional sections and stains are performed, number of H&E slides and special/immunohistochemical stains (if applicable) are recorded but not the number of blocks.

7.1.9 Intraoperative frozen sections (FS) are fozen section assessments that are done for purpose of either assissting intraoperative surgical management or transplant organ procurement. Frozen sections performed as part of complex biopsies (e.g. renal, skin and muscle biopsies) are not included.

7.1.9.1 Count all paraffin blocks and and H&E slides produced for each FS case (including subsequent additional sampling done for the same specimen).

7.1.9.2 If the laboratory subsequently receives additional surgical specimen(s) for the same patient, workload for the new specimen(s) is recorded/counted under 'Routine Surgical Pathology'.

7.1.10 In most centres, trephine biopsies are read by haematologists, together with bone marrow aspirates. However, if they are separately read by Anatomic Pathologists, then the number of cases and specimens are also to be recorded.

7.1.11 For autopsy cases, multiple organs/tissues are frequently collected in one container. Therefore, number of specimens are not counted. For centres which forensic autopsy slides are read by anatomic pathologists, number of cases are to be recorded. If read by forensic pathologists, then only number of paraffin blocks and H&E slides are counted as laboratory workload. Clinical autopsies performed are recorded in individual pathologists workload section.

7.1.12 For oral pathology cases that are reported by anatomic pathologists, they are to be recorded under routine surgical pathology and their complexity classified accordingly. Oral pathology cases that are reported by dental pathologists are separately recorded for purpose of capturing laboratory tissue processing and H&E slide preparation workload.

7.1.13 For specialised tests e.g. immunohistochemical stains, only number of test slides are captured. Control slides (separately stained from test tissue) are not counted. This is to ensure more accurate workload data collection, as well as to encourage better laboratory management.

7.1.14 The number of cell blocks produced for FNA and Non-gynaecological specimens is captured under Cytology workload, even though processing is done in Histopathology laboratory.

7.1.15 Seminal fluid analysis as part of investigation for fertility, is considered as a cytology test, even though traditionally, it may have been performed in microbiology laboratory. Medicolegal samples, including vaginal swabs such as in rape cases, are not handled by diagnostic cytology laboratory.

7.1.16 For test category that may not be listed, workload submission is by temporarily adding it under 'others'. Please inform National Pathology Workload Committee via Head of Discipline, of the test name/category that needs to be added into the test list in both *Borang Beban Kerja Patologi Bulanan 1/2016 - Patologi Anatomik* and *Borang Beban Kerja Patologi Negeri 1/2016 - Patologi Anatomik.*

7.1.17 Workload calculation and recording: Refer to worksheets and corresponding forms on page 12 till page 22.

PATHOLOGY SERVICES, MINISTRY OF HEALTH MALAYSIA
WORKSHEET FOR ANATOMIC PATHOLOGY WORKLOAD (HISTOPATHOLOGY) 1/2016 – For Laboratory Use Only

Hospital: _____Month: _____ Year:_____ Reported by: _____

TESTS PERFORMED BY INDIVIDUAL LABORATORY

No.	Test	Number of cases	Number of specimens	No. of blocks	No. of H&E slides	No. of Tests	GRAND TOTAL
1	Routine Surgical Pathology					*NA*	*NA*
2	Received for 2nd opinion (Referred in)					*NA*	*NA*
3	Intraoperative Frozen section					*NA*	*NA*
4	Trephine biopsy	*NA if reported by Haematologist*	*NA if reported by Haematologist*			*NA*	*NA*
5	Autopsy (Clinical and Forensic)	*NA if reported by Forensic pathologist*	*NA*			*NA*	*NA*
6	Oral pathology (cases reported by dental pathologists)	*NA*	*NA*			*NA*	*NA*
7	Others (if test/category not listed)					*NA*	*NA*
	SPECIALISED TESTS						
8	Immunohistochemical stain	*NA*	*NA*	*NA*	*NA*		
9	Special stain	*NA*	*NA*	*NA*	*NA*		
10	Enzyme histochemical stain	*NA*	*NA*	*NA*	*NA*		
11	Immunofluorescence stain	*NA*	*NA*	*NA*	*NA*		
12	Others (if test/category not listed)	*NA*	*NA*	*NA*	*NA*		
	DIAGNOSTIC MOLECULAR TESTS						
13	Real time- Polymerase Chain Reaction (RT-PCR)	*NA*	*NA*	*NA*	*NA*		
14	Fluorescence In Situ Hybridisation (FISH)	*NA*	*NA*	*NA*	*NA*		
15	Dual/Chromogenic In Situ Hybridisation (DISH/CISH)	*NA*	*NA*	*NA*	*NA*		
16	Others (if test/category not listed)	*NA*	*NA*	*NA*	*NA*		
	TOTAL	*NA*	*NA*			*NA*	*NA*
	GRAND TOTAL					*NA*	*NA*

NA – Not applicable

PATHOLOGY SERVICES, MINISTRY OF HEALTH MALAYSIA

WORKSHEET FOR ANATOMIC PATHOLOGY WORKLOAD (HISTOPATHOLOGY) 1/2016 – For Laboratory Use Only

Hospital: _____ Month: _____ Year:_____ Reported by: _____

REFERRED TESTS (specimens/samples sent to other laboratories for testing and are NON-CHARGEABLE)

No.	Test	Referral Centre	Total No. of Cases
1			
2			
3			
	TOTAL		

OUTSOURCED TESTS (specimens/samples sent to other laboratories for testing and are CHARGEABLE)

No.	Test	Outsource Centre	Total No. of Cases
1			
2			
3			
	TOTAL		

EXPLANATION FOR WORKSHEET FOR ANATOMIC PATHOLOGY WORKLOAD (HISTOPATHOLOGY)
PATHOLOGY SERVICES, MINISTRY OF HEALTH MALAYSIA
WORKSHEET FOR ANATOMIC PATHOLOGY WORKLOAD (HISTOPATHOLOGY) 1/2016 – For Laboratory Use Only

Hospital: _____ Month: _____ Year:_____ Reported by: _____

TESTS PERFORMED BY INDIVIDUAL LABORATORY

No.	Test	Number of cases	Number of specimens	No. of paraffin blocks	No. of H&E slides	TOTAL No. of Tests	GRAND TOTAL
1	Routine Surgical Pathology	*No. of cases received and registered*	*No. of specimens received & examined for each case*	*No. of blocks prepared*	*No. of slides prepared*	*NA*	*NA*
2	Received for 2nd opinion (Referred in)	*No. of cases received and registered*	*No .of specimens received & examined for each case (if applicable)*	*No. of blocks prepared (if applicable)*	*No. of slides prepared (if applicable)*	*NA*	*NA*
3	Intraoperative Frozen section	*No. of cases received and registered*	*No .of specimens received & examined for each case*	*No. of blocks prepared*	*No. of slides prepared*	*NA*	*NA*
4	Trephine biopsy	*NA if reported by Haematologist*	*NA if reported by Haematologist*	*No. of blocks prepared*	*No. of slides prepared*	*NA*	*NA*
5	Autopsy (Clinical and Forensic)	*NA if reported by Forensic pathologist*	*NA*	*No. of blocks prepared*	*No. of slides prepared*	*NA*	*NA*
6	Oral pathology (cases reported by dental pathologists)	*NA*	*NA*	*No. of blocks prepared*	*No. of slides prepared*	*NA*	*NA*
7	Others (if test/category not listed)	*No. of cases received and registered*	*No .of specimens received & examined for each case*	*No. of blocks prepared*	*No. of slides prepared*	*NA*	*NA*
	SPECIALISED TESTS						
8	Immunohistochemical stain	*NA*	*NA*	*NA*	*NA*	*No. of stains performed*	*(Aggregate no of stains performed for 8, 9,10,11,12)*
9	Special stain	*NA*	*NA*	*NA*	*NA*	*No. of stains performed*	
10	Enzyme histochemical stain	*NA*	*NA*	*NA*	*NA*	*No. of stains performed*	
11	Immunofluorescence stain	*NA*	*NA*	*NA*	*NA*	*No. of stains performed*	
12	Others (if test/category not listed)	*NA*	*NA*	*NA*	*NA*	*No. of stains performed*	
	DIAGNOSTIC MOLECULAR TESTS						
13	Real time- Polymerase Chain Reaction (RT-PCR)	*NA*	*NA*	*NA*	*NA*	*No. of tests performed*	*Aggregate no of tests performed for 13,14,15,16)*
14	Fluorescence In Situ Hybridisation (FISH)	*NA*	*NA*	*NA*	*NA*	*No. of tests performed*	
15	Dual/Chromogenic In Situ Hybridisation (DISH/CISH)	*NA*	*NA*	*NA*	*NA*	*No. of tests performed*	
16	Others (if test/category not listed)	*NA*	*NA*	*NA*	*NA*	*No. of tests performed*	
	TOTAL	*NA*	*NA*	*Total no. of paraffin blocks*	*Total no. of H&E slides*	*NA*	*NA*
	GRAND TOTAL	*Total no. of cases*	*Total no. of specimens*	*Aggregate no. of blocks & H&E slides*		*NA*	*NA*

NA – Not applicable

PATHOLOGY SERVICES, MINISTRY OF HEALTH MALAYSIA
WORKSHEET FOR ANATOMIC PATHOLOGY WORKLOAD (CYTOLOGY) 1/2016 – For Laboratory Use Only

Hospital: _____ Month: _____ Year:_____ Reported by: _____

TESTS PERFORMED BY INDIVIDUAL LABORATORY

No.	Test	No. of cases	No. of specimens	No. of slides	No. of cell blocks
1	Gynaecology conventional				*NA*
2	Gynaecology liquid base				*NA*
3	Non-gynaecology				
4	Fine Needle Aspiration				
5	Others (if test/ category not listed)				
	TOTAL	*NA*	*NA*		
	GRAND TOTAL				

REFERRED TESTS (specimens/samples sent to other laboratories for testing and are NON-CHARGEABLE)

No.	Test	Referral Centre	Total No. of Cases
1			
2			
3			
	TOTAL		

OUTSOURCED TESTS (specimens/samples sent to other laboratories for testing and are CHARGEABLE)

No.	Test	Outsource Centre	Total No. of Cases
1			
2			
3			
	TOTAL		

EXPLANATION FOR WORKSHEET FOR ANATOMIC PATHOLOGY WORKLOAD (CYTOLOGY)
PATHOLOGY SERVICES, MINISTRY OF HEALTH MALAYSIA
WORKSHEET FOR ANATOMIC PATHOLOGY WORKLOAD (CYTOLOGY) 1/2016 – For Laboratory Use Only

Hospital: _____ Month: _____ Year:_____ Reported by: _____

TESTS PERFORMED BY INDIVIDUAL LABORATORY

No.	**Test**	**No. of cases**	**No. of specimens**	**No. of slides**	**No. of cell blocks**
1	Gynaecology conventional	*No. of cases registered*	As for no. of cases	*No. of slides prepared*	*NA*
2	Gynaecology liquid base	*No. of cases registered*	As for no. of cases	*No. of slides prepared*	*NA*
3	Non-gynaecology	*No. of cases registered*	*No. of specimens received for each case*	*No. of slides prepared*	*No. of blocks prepared*
4	Fine Needle Aspiration	*No. of cases registered*	*No. of specimens received for each case*	*No. of slides prepared*	*No. of blocks prepared*
5	Others (if test/category not listed)	*No. of cases registered*	*No. of specimens received for each case*	*No. of slides prepared*	*No. of blocks prepared*
	TOTAL	NA	NA	*Total no. of slides prepared*	*Total no. of blocks prepared*
	GRAND TOTAL	***Total no. of cases***	***Total no. of specimens***	***Total no. of tests (total no. of slides & cell blocks)***	

REFERRED TESTS (specimens/samples sent to other laboratories for testing and are NON-CHARGEABLE)

No.	**Test**	**Referral Centre**	**Total No. of Cases**
1			
2			
3			
	TOTAL		

OUTSOURCED TESTS (specimens/samples sent to other laboratories for testing and are CHARGEABLE)

No.	**Test**	**Outsource Centre**	**Total No. of Cases**
1			
2			
3			
	TOTAL		

PATHOLOGY SERVICES
MINISTRY OF HEALTH, MALAYSIA

REPORT ON LABORATORY WORKLOAD: ANATOMIC PATHOLOGY

FOR THE OF MONTH: _____ YEAR : _____

Month or Location of Hospitals, Institutions and Public Health Facilities	HISTOPATHOLOGY						CYTOPATHOLOGY		
	No. of Cases	No. of H&E Slides & Tissue Blocks (a)	No. of Specialised Tests (b)	No. of Diagnostic Molecular Tests (c)	Total No. of Specimens	Total No. of Tests (a + b + c)	No. of Cases	Total No. of Specimens	Total No. of Tests

PATHOLOGY SERVICES, MINISTRY OF HEALTH MALAYSIA
WORKSHEET FOR ANATOMIC PATHOLOGY WORKLOAD (HISTOPATHOLOGY SPECIMEN COMPLEXITY) 1/2016 – For Laboratory Use Only

☐ JAN - JUN Year:_____

☐ JAN - DIS Year: _____

Hospital: _____ Reported by: _____

No.	**Specimen Category**	**Number of cases**	**Number of specimens**
1	Simple	X *No. of cases received and registered*	*X No. of specimens received & examined for each case*
2	Medium	X *No. of cases received and registered*	*X No. of specimens received & examined for each case*
3	Complex	X *No. of cases received and registered*	*X No. of specimens received & examined for each case*
4	Very complex	X *No. of cases received and registered*	*X No. of specimens received & examined for each case*
5	Complex biopsies & Referral cases	X *No. of cases received and registered*	*X No. of specimens received & examined for each case*
	TOTAL		

PATHOLOGY SERVICES, MINISTRY OF HEALTH MALAYSIA
HISTOPATHOLOGY SPECIMEN COMPLEXITY GUIDE 1/2016 – For Laboratory Use Only

Kindly use your clinical discretion/judgement in categorising specimens that may not be listed here

Simple	Medium	Complex	Very Complex	Complex biopsies & Referral cases
Non-complex excision/ small specimen: - Appendix - Fallopian tube - Vas - Tonsils & adenoid - Sebaceous cyst - Nasal polyps - Heart valves - Gallbladder - Ganglion - POC - Mucocele - Cervical polyp (benign) - Fibroepithelial polyp - Dermoid cyst (skin)	**a) Diagnostic biopsy** - wedge/trucut - pipelle/DD&C - skin biopsy(no IF) - abcess biopsy **b) Medium size specimens:** - Salivary gland, orchidectomy, Lymph node, thyroid, breast lump and omentum for benign lesions - Eye (lesional excision) - Prostatic chips - Splenectomy - Simple hysterectomy/ myomectomy - Simple Ovarian cyst - Excision of diabetic ulcer - Tumour excision < 10 cm &/or requiring minimum or no ancillary testing e.g. neurofibroma, lipoma - Diagnostic biopsies as 2-3 separate containers - Ectopic pregnancy/ placenta/ molar pregnancy - Uterus, post partum	**Specimens intermediate between 'medium size' & 'very complex'** Examples: - Pneumonectomy/lobectomy - Simple mastectomy; wide local excision/hookwire localisation - Gastrectomy; Gut resection. - Nephrectomy - Cone biopsy/LLETZ/LEEP - Thyroid malignancy - Ovarian malignancy - TAHBSO specimen for benign lesions - Limb amputation - Tumour excision >10 cm &/or requiring multiple ancillary tests - Diagnostic biopsies sent as 4-10 separate specimens - Rectal biopsy for Hirschprung Disease - Orchidectomy; malignant	**Radical surgery specimens; especially radical dissection requiring margins and lymph node status, resulting in multiple specimens.** Examples: - Radical neck dissection - Mastectomy with axillary resection - Wertheim's hysterectomy - Vulvectomy with lymphadenectomy - Eye exanteration - Laryngectomy - Glossectomy with neck dissection - Mandibulectomy/Maxillectomy - TAHBSO specimen for malignant lesions - Pelvic exenteration or enbloc resection of multiple organs &/or bowel segments	**a) Complex biopsies:** - Lymphoproliferative disorders - Liver biopsies (nonneoplastic) - Muscle biopsies - Renal biopsies (nonneoplastic) - Non neoplastic skin biopsies requiring IF - Biopsies requiring multiple/ extensive immunohisto-chemistry **b) Referral cases:** - Cases received for second opinion

Source*: Akta Fi 1951* and *Perintah Fi (Perubatan) C (Pesakit Bayar Penuh) 2007*

PATHOLOGY SERVICES, MINISTRY OF HEALTH MALAYSIA
WORKSHEET FOR ANATOMIC PATHOLOGY WORKLOAD (INDIVIDUAL PATHOLOGIST) 1/2016 – For Laboratory Use Only

☐ JAN - JUN Year:_____

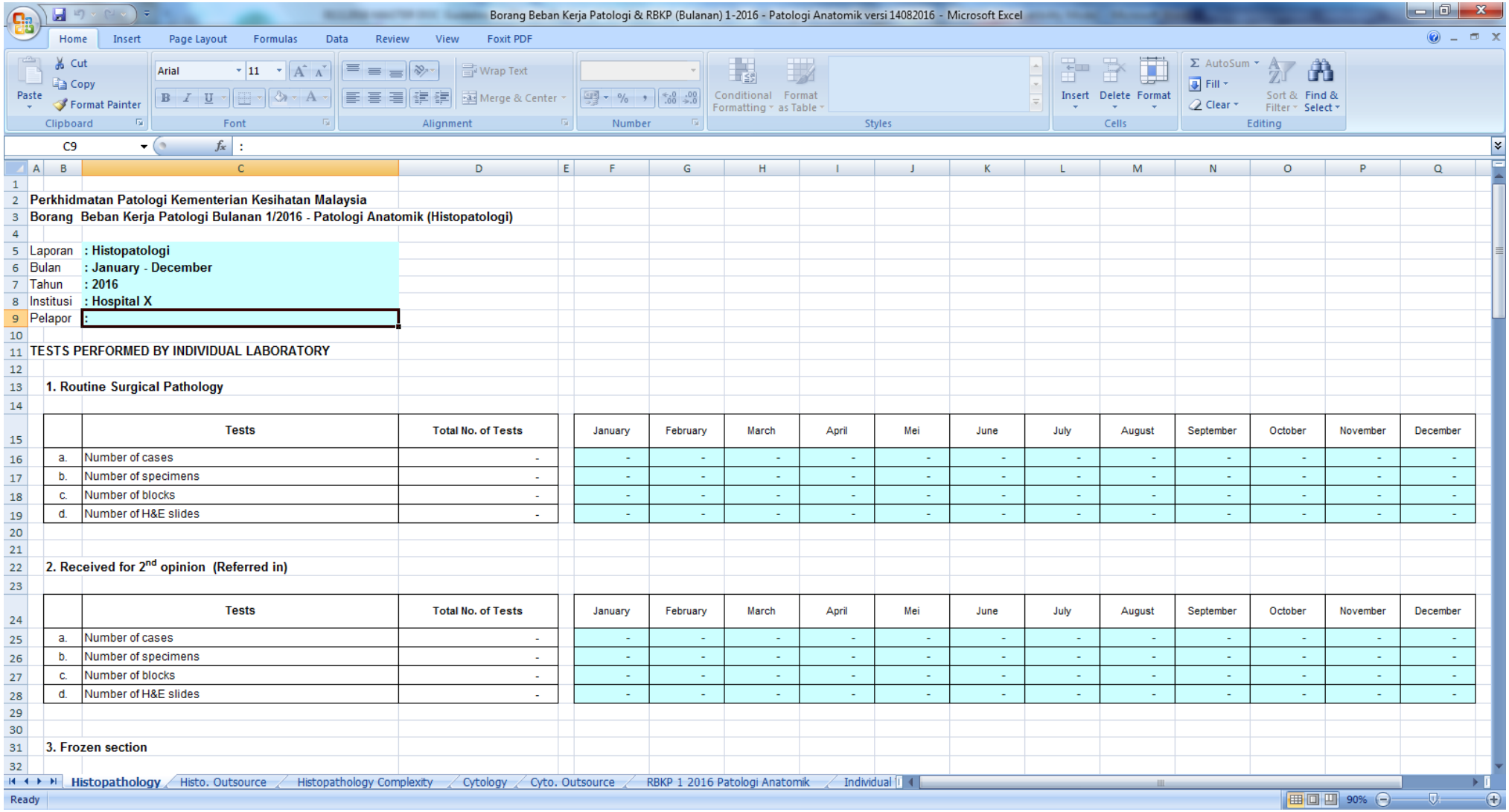
☐ JAN - DIS Year: _____

Hospital: _____ Reported by: _____

No.	NAME	Specify subspecialisation or special posts (e.g.HOD) which may result in less time for daily routine surgical pathology work	*No. of Histopathology Cases Reported & Verified (a)	*No. of Cytopathology Cases Reported & Verified (b)	*Total No. of Histo- & Cyto-Pathology Cases (a+b)	No. of Clinical Autopsy Performed
1						
2						
3						
4						
5						
6						
7						
8						
9						

*Note:
Data are only collected for Histopathology and Cytopathology cases that have been reported and verified from 1st until 30th/31st of each month. Cases that are received/registered for the particular month but have yet to be reported are not counted.

Borang Beban Kerja Patologi Bulanan 1/2016 - Patologi Anatomik ('Excel Soft Copy')



Borang Beban Kerja Patologi & RBKP (Bulanan) 1-2016 - Patologi Anatomik versi 14082016 - Microsoft Excel

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C9 :

Perkhidmatan Patologi Kementerian Kesihatan Malaysia

Borang Beban Kerja Patologi Bulanan 1/2016 - Patologi Anatomik (Histopatologi)

Laporan	: Histopatologi
Bulan	: January - December
Tahun	: 2016
Institusi	: Hospital X
Pelapor	:

TESTS PERFORMED BY INDIVIDUAL LABORATORY

1. Routine Surgical Pathology

	Tests	Total No. of Tests	January	February	March	April	Mei	June	July	August	September	October	November	December
a.	Number of cases	-	-	-	-	-	-	-	-	-	-	-	-	-
b.	Number of specimens	-	-	-	-	-	-	-	-	-	-	-	-	-
c.	Number of blocks	-	-	-	-	-	-	-	-	-	-	-	-	-
d.	Number of H&E slides	-	-	-	-	-	-	-	-	-	-	-	-	-

2. Received for 2nd opinion (Referred in)

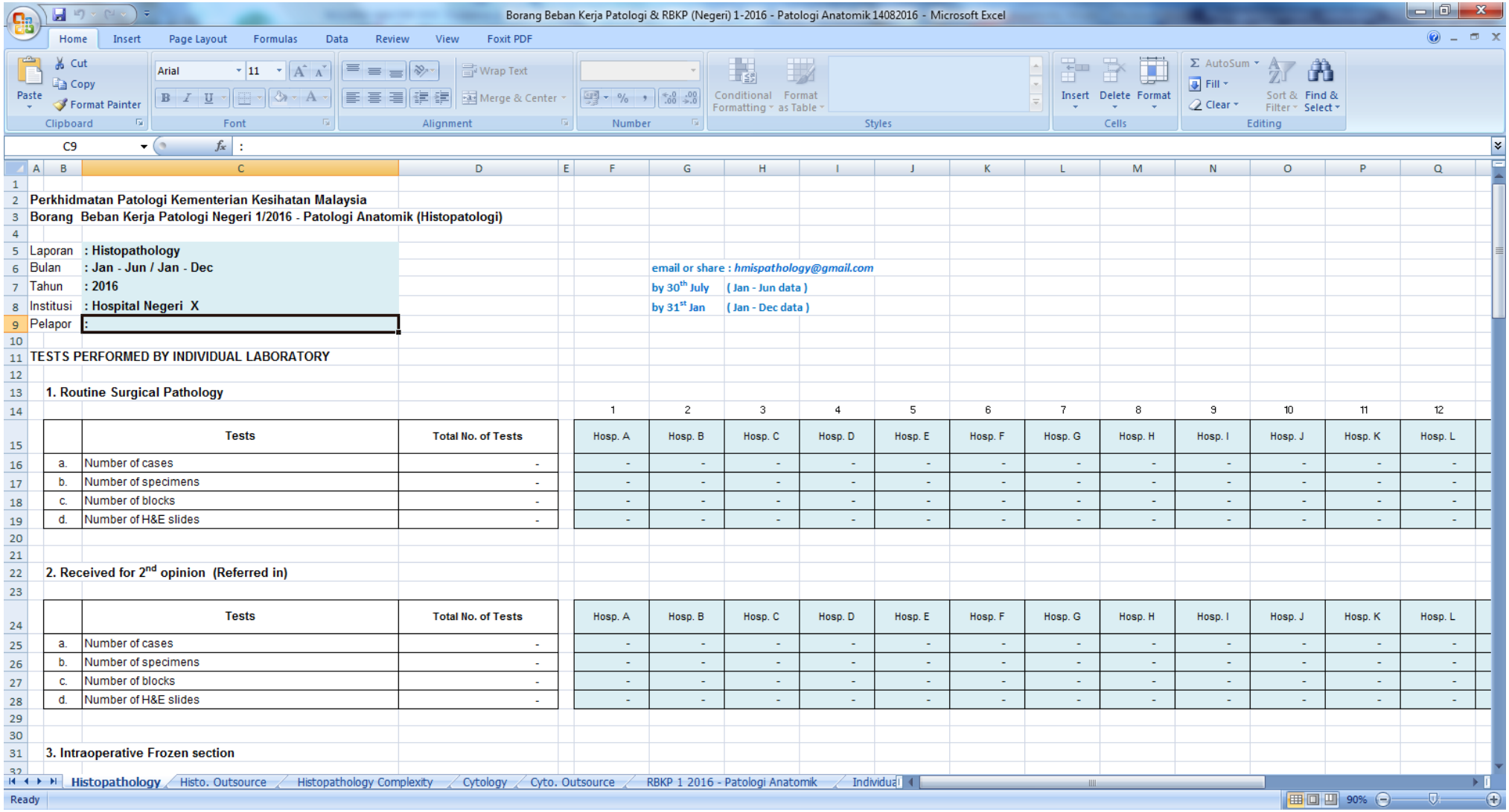
	Tests	Total No. of Tests	January	February	March	April	Mei	June	July	August	September	October	November	December
a.	Number of cases	-	-	-	-	-	-	-	-	-	-	-	-	-
b.	Number of specimens	-	-	-	-	-	-	-	-	-	-	-	-	-
c.	Number of blocks	-	-	-	-	-	-	-	-	-	-	-	-	-
d.	Number of H&E slides	-	-	-	-	-	-	-	-	-	-	-	-	-

3. Frozen section

Histopathology | Histo. Outsource | Histopathology Complexity | Cytology | Cyto. Outsource | RBKP 1 2016 Patologi Anatomik | Individual

Ready 90%

Borang Beban Kerja Patologi Negeri 1/2016 - Patologi Anatomik ('Excel Soft Copy')



7.2 CHEMICAL PATHOLOGY

7.2.1 In addition to workload reporting to MOH using PER-SS 206 (Pin. 1/2000) form, hospital laboratories are also to submit to their respective State Pathologists in soft copy, detailed, as well as summarised workload data on Chemical Pathology, using *Borang Beban Kerja Patologi Bulanan 1/2016 – Patologi Kimia* and *Borang Ringkasan Beban Kerja 1/2016 – Patologi Kimia,* respectively.

7.2.2 The total number of specimens received by a laboratory is calculated from total number of specimens received across the designated groups. These groups are broadly categorised into blood (*serum/ plasma/ whole blood/ cord blood/ blood spot*), urine, body fluid (*CSF/ sweat/ saliva/ pleural fluid/ peritoneal fluid/ pericardial fluid/ synovial fluid/ vitreous humour* etc.) and stool.

7.2.3 Each of the test is classified according to the designated sample type and identified accordingly as blood, cord blood, blood spot, urine, CSF, body fluid (*peritoneal fluid/ pleural fluid/ pericardial fluid/ synovial fluid* etc.), saliva or stool.

7.2.4 Each sample run for blood gases (arterial/venous), shall include pH, pCO_2 and pO_2 as a single test. Other parameters measured by an ABG analyzer are counted separately in the routine chemistry group; e.g. Sodium, Potassium and Ionized Calcium.

7.2.5 Tests listed are for automated measurements of analytes, unless stated as non-automated methods e.g. qualitative, semi-quantitative or by dipstick/teststrip.

7.2.6 Capillary Bilirubin is the measurement of Total Serum Bilirubin by using spectrophotometer (Bilirubinometer).

7.2.7 LDL Cholesterol Direct is considered as one test if it is measured. Calculated LDL Cholesterol is not counted as a test.

7.2.8 There are three main categories of routine tests for urine i.e. urine biochemistry, urine for casts and crystals (manual microscopy or automated) and urine for culture and sensitivity (C&S). Only the latter is considered as a truly microbiology test. The final workload for urine biochemistry and urine casts and crystals is to be reported under Chemical Pathology, regardless of where the tests are performed. This principle also applies for urine for eosinophils and urine for dysmorphic rbcs.

7.2.9 Urine biochemistry by teststrip/dipstick method may be analysed either manually or using semi-automated or fully automated analyzer. The workload is captured as a single test for each teststrip used, regardless of number of parameters measured and method of analysis.

7.2.10 There are several tests generally performed under Chemical Pathology but are also analysed by other disciplines, namely Serology/Immunology. These tests include urine pregnancy test, CRP, C3, C4, IgG, IgA,IgM and IgE. The workload for these tests are captured depending on the local practices and the discipline performing the tests. The final workload however, is to be reported under Chemical Pathology.

7.2.11 Each Dynamic Function Test is counted as a single profile and to be considered as one test. The individual test in the dynamic function tests are included/calculated in the respective designated groups.

7.2.12 Acylcarnitine profile is included in the blood spot IEM screening.

7.2.13 Urine metabolic screening is considered as two tests. The tests include analysis of amino acids and acylcarnitine under positive and negative ion mode which requires different sample preparation and injection into LCMS/MS.

7.2.14 For molecular testing, the workload calculation is based on the number of panel of exons per gene tested, i.e. every exon tested in a gene is considered as one test.

7.2.15 Drug of Abuse (DOA) screening and confirmatory tests are counted separately as individual tests. For DOA confirmation the parent drug and its metabolites are regarded as individual tests and are reported according to the analytes tested.

7.2.16 Any dilution performed for analyte measurement is considered as an additional test and to be included in the workload calculation. The dilution procedure is counted as one additional test, regardless of the number of serial dilutions performed.

7.2.17 Any test offered that is not in the list, requires the workload submission to be temporarily added under 'others' and according to designated groups. Please inform National Pathology Workload Committee via Head of Discipline, of the test names that need to be added into the test list in both *Borang Beban Kerja Patologi Bulanan 1/2016 - Patologi Kimia* and *Borang Beban Kerja Patologi Negeri 1/2016 - Patologi Kimia.*

7.2.18 Workload calculation and recording:

A. SAMPLE TYPE AND SPECIMEN NUMBER

No.	Sample type	No. of specimens
1	Blood	
2	Urine	
3	Body Fluid	
4	Stool	
	Total number of specimens	

B. ROUTINE CHEMISTRY

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
1	Albumin	Blood	*Total no. of specimens received.*	*x 1*
2	Alkaline Phosphatase (ALP)	Blood		*x 1*
3	Alkaline Transaminase (ALT)	Blood		*x 1*
4	Ammonia	Blood		*x 1*
5	Amylase	Blood		*x 1*
6	Aspartate Transaminase (AST)	Blood		*x 1*
7	Bicarbonate	Blood		*x 1*
8	Bilirubin Direct	Blood		*x 1*
9	Bilirubin Total	Blood		*x 1*
10	Bilirubin Total Capillary (Bilirubinometer)	Blood		*x 1*
11	Calcium Ionised	Blood		*x 1*
12	Calcium Total	Blood		*x 1*
13	Chloride	Blood		*x 1*
14	Cholesterol Total	Blood		*x 1*
15	Corrected Calcium Total	Blood		*x 1*
16	Creatine Kinase	Blood		*x 1*
17	Creatinine	Blood		*x 1*
18	Gamma Glutamyl Transferase (GGT)	Blood		*x 1*
19	Glucose	Blood		*x 1*
20	HDL Cholesterol	Blood		*x 1*
21	Ketones	Blood		*x 1*
22	Lactate	Blood		*x 1*
23	Lactate Dehydrogenase (LDH)	Blood		*x 1*
24	LDL Cholesterol Direct (Measured)	Blood		*x 1*
25	Magnesium	Blood		*x 1*
26	Osmolality	Blood		*x 1*
27	Potassium	Blood		*x 1*
28	Phosphate Inorganic	Blood		*x 1*
29	Protein Total	Blood		*x 1*
30	Pyruvate	Blood		*x 1*
31	Sodium	Blood		*x 1*
32	Triglyceride	Blood		*x 1*
33	Urea	Blood		*x 1*
34	Uric Acid (Urate)	Blood		*x 1*
35	Blood Gases (Arterial/Venous)	Blood		*x 1*
36	Albumin	Urine		*x 1*
37	Albumin Creatinine Ratio (UACR)	Urine		*x 1*
38	Amylase/Diastase	Urine		*x 1*
39	Creatinine Clearance	Urine		*x 1*
40	Calcium	Urine		*x 1*
41	Chloride	Urine		*x 1*
42	Creatinine	Urine		*x 1*
43	Fat Globules Urine (Qualitative)	Urine		*x 1*
44	Glucose	Urine		*x 1*
45	Ketones	Urine		*x 1*
46	Magnesium	Urine		*x 1*
47	Osmolality Urine	Urine		*x 1*
48	Potassium	Urine		*x 1*

49	Protein Creatinine Index (UPCI)	Urine		*x 1*
50	Phosphate Inorganic	Urine		*x 1*
51	Protein	Urine		*x 1*
52	Reducing Sugar Urine	Urine		*x 1*
53	Sodium	Urine		*x 1*
54	Urea	Urine		*x 1*
55	Uric Acid (Urate)	Urine		*x 1*
56	Urine Biochemistry (Striptest/Dipstick-Qualitative)	Urine		*x 1*
57	Urinary Cast and Crystal	Urine		*x 1*
58	Urine for dysmorphic RBC	Urine		*x 1*
59	Urine for eosinophil	Urine		*x 1*
60	Urine Pregnancy Test (Qualitative)	Urine		*x 1*
61	Urine Microalbumin Test Strip (Semi-Quantitative)	Urine		*x 1*
62	Urine Microscopy (Manual)	Urine		*x 1*
63	Urine Microscopy (Automated)	Urine		*x 1*
64	Albumin CSF	CSF		*x 1*
65	Chloride CSF	CSF		*x 1*
66	Glucose CSF	CSF	*Total no. of specimens received.*	*x 1*
67	Lactate CSF	CSF		*x 1*
68	Protein CSF	CSF		*x 1*
69	Pyruvate CSF	CSF		*x 1*
70	Globulin CSF (Qualitative)	CSF		*x 1*
71	Albumin Body Fluids	Body Fluids		*x 1*
72	Amylase Body Fluids	Body Fluids		*x 1*
73	Creatinine Body Fluids	Body Fluids		*x 1*
74	Cholesterol Body Fluids	Body Fluids		*x 1*
75	Chloride Body Fluids	Body Fluids		*x 1*
76	Glucose Body Fluids	Body Fluids		*x 1*
77	Urea Peritoneal Dialysate Body Fluids	Body Fluids		*x 1*
78	Lactate Dehydrogenase (LDH)	Body Fluids		*x 1*
79	pH Body Fluid	Body Fluids		*x 1*
80	Potassium Body Fluids	Body Fluids		*x 1*
81	Protein, Body Fluids	Body Fluids		*x 1*
82	Sodium Body Fluids	Body Fluids		*x 1*
83	Fat Globules Stool (Qualitative)	Stool		*x 1*
84	Reducing Sugar Stool (Qualitative)	Stool		*x 1*
85	Stool occult blood (Qualitative)	Stool		*x 1*
86	Others (if test not listed)	Urine		*x 1 each*
			TOTAL	

C. ENDOCRINE AND METABOLIC

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
(C I)	**ENDOCRINE**			
1	17 Hydroxy Progesterone	Blood	*Total no. of specimens received.*	*x 1*
2	Adrenocorticotrophic Hormone (ACTH)	Blood		*x 1*
3	Aldosterone	Blood		*x 1*
4	Androstenedione	Blood		*x 1*

5	Antidiuretic Hormone (ADH)	Blood		*x 1*
6	Anti- Thyroglobulin Antibody	Blood		*x 1*
7	Anti-Thyroid Receptor Antibodies	Blood		*x 1*
8	Beta Cross Laps	Blood		*x 1*
9	Calcitonin	Blood		*x 1*
10	Cortisol	Blood		*x 1*
11	C-Peptide	Blood		*x 1*
12	Dehydroepiandrosterone Sulphate (DHEAS)	Blood		*x 1*
13	Erythropoietin	Blood		*x 1*
14	Follicle Stimulating Hormone (FSH)	Blood		*x 1*
15	Gastrin	Blood		*x 1*
16	Glucagon	Blood		*x 1*
17	Growth Hormone (Somatotrophin)	Blood		*x 1*
18	Gonadotrophin Releasing Hormone (GnRH)	Blood		*x 1*
19	Insulin-like Growth Factor, Binding	Blood		*x 1*
20	Insulin-like Growth Factor 1 (IGF-1)	Blood		*x 1*
21	Insulin	Blood		*x 1*
22	Parathyroid Hormone (intact) 2nd generation	Blood		*x 1*
23	Parathyroid Hormone (whole) 3rd generation	Blood		*x 1*
24	Procalcitonin	Blood		*x 1*
25	Pro-Insulin	Blood		*x 1*
26	Luteinising Hormone (LH)	Blood		*x 1*
27	Macroprolactin	Blood		*x 1*
28	Oestradiol	Blood		*x 1*
29	P1NP	Blood		*x 1*
30	Prolactin	Blood	*Total no. of specimens received.*	*x 1*
31	Progesterone	Blood		*x 1*
32	Renin	Blood		*x 1*
33	Sex Hormone Binding Globulins (SHBG)	Blood		*x 1*
34	Tri-Iodothyronine (Free T3)	Blood		*x 1*
35	Thyroxine Free (Free T4)	Blood		*x 1*
36	Thyroxine Total (T4)	Blood		*x 1*
37	Testosterone	Blood		*x 1*
38	Thyroglobulin	Blood		*x 1*
39	Thyroid Stimulating Hormone (TSH)	Blood		*x 1*
40	Thyroid Microscomal Antibody	Blood		*x 1*
41	TSH Cord Blood	Cord Blood		*x 1*
42	Free T4 Cord Blood	Cord Blood		*x 1*
43	24-hr Urine 17-OH Keto Steroids	Urine		*x 1*
44	24-hr Urine 17, Ketogenic Steroids	Urine		*x 1*
45	**24-hr Urine Cathecholamines**			
	pH Urine	Urine		*x 1*
	Creatinine Urine - Under Routine Chemistry (RC)			*Captured under RC*
	Cathecholamines			*x 1*
46	24-hr Urine Cortisol	Urine		*x 1*
47	24-hr Urine Free Cortisol	Urine		*x 1*
48	24-hr Urine Pregnanetriol	Urine		*x 1*
49	**24-hr Urine Metanephrines**			
	pH Urine	Urine		*x 1*
	Creatinine Urine - Under Routine Chemistry (RC)			*Captured under RC*
	Metanephrines			*x 1*

50	Midnight Salivary Cortisol	Saliva		*x 1*
51	Others (if test not listed)			*x 1 each*
			SUBTOTAL ENDOCRINE	
(C II) METABOLIC				
1	Anti-Glutamic acid decarboxylase (GAD)	Blood	*Total no. of specimens received.*	*x 1*
2	Anti islet cells (ICA)	Blood		*x 1*
3	Anti-insulin G	Blood		*x 1*
4	Anti-Insulinoma-Associated Antigen 2 (IA2)	Blood		*x 1*
5	B 1, Vitamin (Thiamin)	Blood		*x 1*
6	B 3, Vitamin (Niacin)	Blood		*x 1*
7	B 6, Vitamin (Pyridoxin)	Blood		*x 1*
8	B 12, Vitamin	Blood		*x 1*
9	Beta Carotene	Blood		*x 1*
10	D, Vitamin	Blood		*x 1*
11	E, Vitamin	Blood		*x 1*
12	Ferritin	Blood		*x 1*
13	Folate	Blood		*x 1*
14	Folate RBC	Blood		*x 1*
15	Fructosamine	Blood		*x 1*
16	HbA1c (Glycated Hemoglobin)	Blood		*x 1*
17	Iron, Total	Blood		*x 1*
18	Iron Binding Capacity, Total (TIBC) - measured	Blood		*x 1*
19	Iron Binding Capacity, Unsaturated (UIBC) - measured	Blood		*x 1*
20	Oxalate	Blood		*x 1*
21	Transferrin	Blood		*x 1*
22	Iron, Total Urine	Urine		*x 1*
23	Sweat test	Sweat		*x 1*
24	Others (if test not listed)			*x 1 each*
			SUBTOTAL METABOLIC	
			TOTAL ENDOCRINE AND METABOLIC	

D. CARDIAC MARKERS

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
1	Creatine Kinase Isoenzyme (CKMB) activity	Blood	*Total no. of specimens received.*	*x 1*
2	Creatine Kinase Isoenzyme (CK-MB) Mass	Blood		*x 1*
3	Troponin-T	Blood		*x 1*
4	Troponin-I	Blood		*x 1*
5	Brain Natriuretic Peptide (BNP)	Blood		*x 1*
6	Others (if test not listed)			*x 1 each*
			TOTAL	

E. TUMOUR MARKERS

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
1	Alpha Feto-Protein (AFP)	Blood	*Total no. of specimens received.*	*x 1*
2	Beta Human Chorionic Gonadotrophin	Blood		*x 1*
3	Cancer Antigen 125 (CA 125)	Blood		*x 1*
4	Cancer Antigen 15-3 (CA 15-3)	Blood		*x 1*
5	Cancer Antigen 19-9 (CA 19-9)	Blood		*x 1*
6	Carcinoembryonic Antigen (CEA)	Blood		*x 1*
7	Chromogranin A	Blood		*x 1*
8	Prostate Specific Antigen (PSA) Total	Blood		*x 1*
9	Prostate Specific Antigen (Free)	Blood		*x 1*
10	Others (if test not listed)			*x 1 each*
			TOTAL	

F. THERAPEUTIC DRUG MONITORING (TDM)

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
1	Amikacin	Blood	*Total no. of specimens received.*	*x 1*
2	Carbamazepine	Blood		*x 1*
3	Cyclosporine	Blood		*x 1*
4	Digoxin	Blood		*x 1*
5	Everolimus	Blood		*x 1*
6	Gentamicin	Blood		*x 1*
7	Lithium	Blood		*x 1*
8	Methadone Blood	Blood		*x 1*
9	Methaqualone	Blood		*x 1*
10	Methotrexate (MTX)	Blood		*x 1*
11	Netilmicin	Blood		*x 1*
12	Phenobarbital	Blood		*x 1*
13	Phenytoin (Dilantin)	Blood		*x 1*
14	Sirolimus	Blood		*x 1*
15	Tacrolimus	Blood		*x 1*
16	Theophylline	Blood		*x 1*
17	Valproic acid	Blood		*x 1*
18	Vancomycin	Blood		*x 1*
19	Methadone Urine	Urine		*x 1*
20	Others (if test not listed)			*x 1 each*
			TOTAL	

G. TOXICOLOGY

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
1	Acetaminophen	Blood	*Total no. of specimens received.*	*x 1*
2	Alcohol (Ethanol)	Blood		*x 1*
3	Benzodiazepine	Blood		*x 1*
4	Cholinesterase	Blood		*x 1*
5	Methanol	Blood		*x 1*

6	Salicylate	Blood	*Total no. of specimens received.*	*x 1*
7	Alcohol (Ethanol) Urine	Urine		*x 1*
8	Paraquat Urine	Urine		*x 1*
9	Salicylate Urine	Urine		*x 1*
10	Others (if test not listed)			*x 1 each*
			TOTAL	

H. DRUG OF ABUSE (DOA)

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
1	Adulteration test; Creatinine	Urine	*Total no. of specimens received.*	*x 1*
2	Adulteration test; Specific Gravity	Urine		*x 1*
3	Adulteration test; pH	Urine		*x 1*
4	Amphetamine screening	Urine		*x 1*
5	Amphetamine confirmation	Urine		*x 1*
6	Benzodiazepines screening	Urine		*x 1*
7	Benzoylecgonine	Urine		*x 1*
8	Cannabinoids screening	Urine		*x 1*
9	Cannabinoids confirmation	Urine		*x 1*
10	Cocaine screening	Urine		*x 1*
11	Cocaine confirmation	Urine		*x 1*
12	Codeine	Urine		*x 1*
13	Dextromethorphan	Urine		*x 1*
14	Ephedrine	Urine		*x 1*
15	Hydroxy-norketamine	Urine		*x 1*
16	Ketamine screening	Urine		*x 1*
17	Ketamine confirmation	Urine		*x 1*
18	Lysergic acid diethylamide (LSD) screening	Urine		*x 1*
19	Lysergic acid diethylamide (LSD) confirmation	Urine		*x 1*
20	Methamphetamine screening	Urine		*x 1*
21	Methamphetamine confirmation	Urine		*x 1*
22	Methylenedioxyethylamphetamine (MDEA)	Urine		*x 1*
23	Methylenedioxymethamphetamine (MDMA)	Urine		*x 1*
24	Monoacetylmorphine screening	Urine		*x 1*
25	Monoacetylmorphine confirmation	Urine		*x 1*
26	Morphine confirmation	Urine		*x 1*
27	*N*-methyl-1,3-benzodioxolylbutanamine (MBDB)	Urine		*x 1*
28	Norephedrine	Urine		*x 1*
29	Norketamine	Urine		*x 1*
30	Nimetazepam	Urine		*x 1*
31	Nitrazepam	Urine		*x 1*
32	Opiate screening	Urine		*x 1*
33	Phencyclidine (PCP) screening	Urine		*x 1*
34	Phencyclidine (PCP) confirmation	Urine		*x 1*
35	Phentermine	Urine		*x 1*
36	Others (if test not listed)			*x 1 each*
			TOTAL	

I. DYNAMIC FUNCTION TEST

No.	Dynamic Function Test (DFT)	No. of DFT
1	ACTH stimulation for Congenital Adrenal Hyperplasia (CAH)	*1 DFT*
2	Adrenal Venous Sampling (AVS)	*1 DFT*
3	Arterial Stimulation and Venous Sampling (ASVS)	*1 DFT*
4	Aldosterone Renin Ratio (ARR)	*1 DFT*
5	Ammonium Chloride Loading Test	*1 DFT*
6	Captopril Challenge Test	*1 DFT*
7	Combined Anterior Pituitary Function Test	*1 DFT*
8	CRH Stimulation Test	*1 DFT*
9	Fludrocortisone Suppression Test	*1 DFT*
10	Free Androgen Index (FAI)	*1 DFT*
11	Gonadotropin Releasing hormone Stimulation Test	*1 DFT*
12	Glucagon Stimulation Test	*1 DFT*
13	High Dose Dexamethasone Suppression Test (HDDST)	*1 DFT*
14	Human Chorionic Gonadotrophin Test (hCG test)	*1 DFT*
15	Inferior Petrosal Sinus Sampling (IPSS)	*1 DFT*
16	Insulin Tolerance Test	*1 DFT*
17	Low Dose Dexamethasone Suppression Test	*1 DFT*
18	Metoclopramide Stimulation Test	*1 DFT*
19	Overnight Dexamethasone Suppression Test (ODST)	*1 DFT*
20	Saline Suppression Test	*1 DFT*
21	Short Synacthen Test	*1 DFT*
22	Water Deprivation Test	*1 DFT*
23	Water Loading Test	*1 DFT*
24	Others (if test not listed)	*1 DFT each*
	TOTAL	

J. SPECIAL PROTEIN AND PROTEOMICS

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
1	Alpha-1-Antitrypsin-Quantitation	Blood	*Total no. of specimens received.*	*x 1*
2	Alpha-1-Antitrypsin-Phenotyping			
	Alpha-1-Antitrypsin-Quantitation	Blood		*x 1*
	Alpha-1-Antitrypsin-Electrophoresis gel			*x 1*
3	Alpha-1-Acid Glycoprotein (Orosomucoids)	Blood		*x 1*
4	Alpha 2 Macroglobulin	Blood		*x 1*
5	Apolipoprotein A-1	Blood		*x 1*
6	Apolipoprotein B	Blood		*x 1*
7	Apolipoprotein C	Blood		*x 1*
8	Apolipoprotein D	Blood		*x 1*
9	Apolipoprotein E	Blood		*x 1*
10	Apolipoprotein E (Phenotyping)	Blood		*x 1*
11	Beta-2 Microglobulin	Blood		*x 1*
12	Complement 3 (C3)	Blood		*x 1*

13	Complement 4 (C4)	Blood		*x 1*
14	Caeruloplasmin	Blood		*x 1*
15	C-Reactive Protein (CRP)	Blood		*x 1*
16	Cryoglobulin screening	Blood		*x 1*
17	Cryoglobulin	Blood		*x 1*
	Plasma Electrophoresis and Immunofixation	Blood		*Captured under SPE and IF*
	Serum Electrophoresis and Immunofixation	Blood		
18	Free Kappa Light Chain Serum	Blood		*x 1*
19	Free Lambda Light Chain Serum	Blood		*x 1*
20	Haptoglobin	Blood		*x 1*
21	Immunoglobulin A (IgA)	Blood		*x 1*
22	Immunoglobulin E (IgE)	Blood		*x 1*
23	Immunoglobulin G (IgG)	Blood		*x 1*
24	Immunoglobulin M (IgM)	Blood		*x 1*
25	Lipoprotein (a) Electrophoresis	Blood		*x 1*
26	Myoglobin Serum	Blood		*x 1*
27	Pre Albumin Quantitative	Blood		*x 1*
28	Transferrin	Blood		*x 1*
29	**Transferrin Isoform**			
	Total Protein	Blood		*x 1*
	Electrophoresis Gel			*x 1*
30	**Protein Electrophoresis Serum**			
	Total Protein Serum	Blood		*x 1*
	Protein Electrophoresis Gel Test			*x 1*
31	**Protein Immunofixation Serum**		*Total no. of specimens received.*	
	Albumin	Blood		*x 1*
	Immunoglobulin G (IgG)			*x 1*
	Immunoglobulin A (IgA)			*x 1*
	Immunoglobulin M (IgM)			*x 1*
	Kappa			*x 1*
	Lambda			*x 1*
	Immunofixation Gel Test			*x 1*
32	**Protein Immunofixation Serum (D,E)**			
	Immunofixation Gel Test (5 antisera: IgG,IgD,IgE, Kappa & Lambda)			*x 1*
33	Free Kappa Light Chain Urine	Urine		*x 1*
34	Free Lambda Light Chain Urine	Urine		*x 1*
35	**Protein Electrophoresis Urine**			
	Concentrate Urine	Urine		*x 1*
	Total Protein Urine			*x 1*
	Protein Electrophoresis Gel Test			*x 1*
36	**Protein Immunofixation Urine**			
	Albumin	Urine		*x 1*
	Immunoglobulin G (IgG)			*x 1*
	Immunoglobulin A (IgA)			*x 1*
	Immunoglobulin M (IgM)			*x 1*
	Kappa			*x 1*
	Lambda			*x 1*
	Immunofixation Gel Test			*x 1*

37	**Beta-2 Microglobulin Urine**		*Total no. of specimens received.*	
	Beta-2 Microglobulin Urine	Urine		*x 1*
	Beta-2 Microglobulin Serum	Blood		*x 1*
	Myoglobin Urine	Urine		*x 1*
38	**Protein Electrophoresis CSF**	CSF		
	Albumin CSF			*x 1*
	IgG CSF			*x 1*
	Total Protein CSF			*x 1*
	CSF Protein Electrophoresis Gel (CSF & Serum)			*x 1*
	Albumin Serum	Blood		*x 1*
	IgG Serum			*x 1*
	Total Protein Serum			*x 1*
39	**Beta-2 Microglobulin CSF**			
	Beta-2 Microglobulin CSF	CSF		*x 1*
	Beta-2 Microglobulin Serum	Blood		*x 1*
40	Lecithin/Sphingomyelin Ratio Amniotic Fluid	Body Fluid		*x 1*
41	Others (if test not listed)			*x 1 each*
			TOTAL	

K. ENZYMOLOGY

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
1	Acid Phosphatase	Blood	*Total no. of specimens received.*	*x 1*
2	Alkaline Phosphatase Isoenzymes	Blood		*x 1*
3	Alkaline Phosphatase Bone Spesific	Blood		*x 1*
4	Aldolase	Blood		*x 1*
5	Erythrocyte transketolase	Blood		*x 1*
6	Lactate Dehydrogenase Iso-enzymes	Blood		*x 1*
7	Others (if test not listed)			*x 1*
			TOTAL	

L. TRACE ELEMENTS

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
1	Aluminium	Blood	*Total no of specimens received.*	*x 1*
2	Cadmium	Blood		*x 1*
3	Chromium	Blood		*x 1*
4	Copper	Blood		*x 1*
5	Fluoride	Blood		*x 1*
6	Lead	Blood		*x 1*
7	Mercury	Blood		*x 1*
8	Selenium	Blood		*x 1*
9	Zinc	Blood		*x 1*
10	Aluminium Urine	Urine		*x 1*
11	Arsenic Urine, 24H	Urine		*x 1*
12	Benzoylecgonine Urine	Urine		*x 1*

13	Cadmium Urine	Urine	*Total no of specimens received.*	*x 1*
14	Copper Urine, 24H	Urine		*x 1*
15	Fluoride Urine	Urine		*x 1*
16	Iodine Urine	Urine		*x 1*
17	Lead Urine, 24H	Urine		*x 1*
18	Mercury Urine	Urine		*x 1*
19	Aluminium	Body Fluid		*x 1*
20	Antimony	Body Fluid		*x 1*
21	Arsenic	Body Fluid		*x 1*
22	Barium	Body Fluid		*x 1*
23	Beryllium	Body Fluid		*x 1*
24	Cadmium	Body Fluid		*x 1*
25	Chloramines	Body Fluid		*x 1*
26	Chromium	Body Fluid		*x 1*
27	Copper	Body Fluid		*x 1*
28	Fluoride	Body Fluid		*x 1*
29	Free Chlorine	Body Fluid		*x 1*
30	Lead	Body Fluid		*x 1*
31	Mercury	Body Fluid		*x 1*
32	Selenium	Body Fluid		*x 1*
33	Silver	Body Fluid		*x 1*
34	Sulphate	Body Fluid		*x 1*
35	Thallium	Body Fluid		*x 1*
36	Zinc	Body Fluid		*x 1*
37	Lead Hair	Hair		*x 1*
38	Others (if test not listed)			*x 1 each*
			TOTAL	

M. BIOCHEMICAL GENETICS

No.	Test Name	Sample Type	No. Specimens	No. of Test performed
1	Acid alpha-Glucosidase	Blood Spot	*Total no. of specimens received.*	*x 1*
2	Galactose 1-Uridyl transferase	Blood Spot		*x 1*
3	Galactose, Total	Blood Spot		*x 1*
4	IEM screening (Blood Spot)	Blood Spot		*x 1*
5	Lysosomal Storage disease (LSD) screening	Blood Spot		*x 1*
6	Biotinidase enzyme activity	Blood Spot		*x 1*
7	Amino acid Plasma	Blood		*x 1*
8	Carnitine, Free Plasma	Blood		*x 1*
9	Carnitine, Total Plasma	Blood		*x 1*
10	CDG phenotyping	Blood		*x 1*
11	α-fucosidase	Blood		*x 1*
12	α-galactosidase	Blood		*x 1*
13	α-hexosaminidase (AHEX	Blood		*x 1*
14	α-iduronidase (IDA)	Blood		*x 1*
15	α-mannosidase (AMAN)	Blood		*x 1*
16	α-N-acetyl-galactosaminidase	Blood		*x 1*
17	Aryl Sulphatase A	Blood		*x 1*
18	Aspartyl Glucosaminidase (GASP)	Blood		*x 1*
19	Branching enzyme (GSD IV)	Blood		*x 1*

20	β-glucuronidase (BGLUCU)	Blood	Total no. of specimens received.	*x 1*
21	β-hexosaminidase A (MUGS)	Blood		*x 1*
22	β-galactosidase	Blood		*x 1*
23	β-glucosidase	Blood		*x 1*
24	β-hexosaminidase (BHEX)	Blood		*x 1*
25	β-mannosidase (BMAN)	Blood		*x 1*
26	Galactocerebrosidase (GALC)	Blood		*x 1*
27	Heparan Sulphamidase (SULP)	Blood		*x 1*
28	Iduronate-2-sulphatase (IDS)	Blood		*x 1*
29	Methylmalonic acid	Blood		*x 1*
30	N-acetylgalactosamine-6-sulfatase (GALSO)	Blood		*x 1*
31	N-acetylgalactosamine 4-sulphatase / Arylsuphatase B (ASB)	Blood		*x 1*
32	Palmitoyl Protein Thioesterase	Blood		*x 1*
33	Homocysteine Total, Plasma	Blood		*x 1*
34	Pipecolic acid Plasma	Blood		*x 1*
35	VLCFA & Phytanic acid Plasma	Blood		*x 1*
36	Amino acid CSF	CSF		*x 1*
37	Biogenic Amines CSF	CSF		*x 1*
38	Pterins CSF	CSF		*x 1*
39	Alpha-aminoadipic semialdehyde	Urine		*x 1*
40	Amino acid Urine	Urine		*x 1*
41	Biogenic Amines Urine	Urine		*x 1*
42	Carnitine, 24Hr Urine	Urine		*x 1*
43	Creatine	Urine		*x 1*
44	Cystine Urine (Qualitative)	Urine		*x 1*
45	Delta Amino Laevulinic Acid Urine, 24Hr Urine	Urine		*x 1*
46	Glycosaminoglycans (Quantitation)	Urine		*x 1*
47	Homocystine Urine (Qualitative)	Urine		*x 1*
48	IEM Screening, Urine			
	Amino Acids	Urine		*x 1*
	Acylcarnitine	Urine		*x 1*
49	Methylmalonic acid	Urine		*x 1*
50	Mucopolysacharides (High ResolutionElectrophoresis) Urine	Urine		*x 1*
51	Oligosaccharides Urine	Urine		*x 1*
52	Organic Acids Urine	Urine		*x 1*
53	Orotic Acid (Orotate) Urine	Urine		*x 1*
54	Pipecolic	Urine		*x 1*
55	Porphobilinogen Urine	Urine		*x 1*
56	Porphyrins Urine	Urine		*x 1*
57	Pterins Urine	Urine		*x 1*
58	Purine & Pyrimidine Urine	Urine		*x 1*
59	Sialic acids Total Urine	Urine		*x 1*
60	Sialic acids Free Urine	Urine		*x 1*
61	Succinylacetone	Urine		*x 1*
62	Sugars and polyols	Urine		*x 1*
63	Sulfocysteine	Urine		*x 1*
64	Sulphite	Urine		*x 1*
65	5-hydroxy-Indol-Acetic Acid (5 HIAA) 24Hr Urine	Urine		*x 1*
66	Urobilinogen	Urine		*x 1*
67	Others (if test not listed)			*x 1 each*
			TOTAL	

N. MOLECULAR GENETICS

Method Classification :

M : Manual
S : Semi automation
F : Full automation

No.	Test Name	Sample Type	No. Specimens	Method M/S/F	No. of Test performed
1	Acute Intermittent Porphyria (*HMBS*) Sequencing	Blood	*Total no. of specimens received.*		*x No. of test panel tested*
2	Acute Intermittent Porphyria (*HMBS*) MLPA	Blood			*x No. of test panel tested*
3	Alagille Syndrome (*JAG1*) Sequencing	Blood			*x No. of test panel tested*
4	Alagille Syndrome (*JAG1*) MLPA	Blood			*x No. of test panel tested*
5	Alagille Syndrome (*NOTCH2*)	Blood			*x No. of test panel tested*
6	Alexander Disease (*GFAP*)	Blood			*x No. of test panel tested*
7	Alpha 1-Antitrypsin Deficiency (*SERPINA1*)	Blood			*x No. of test panel tested*
8	Angelman Syndrome (*SNRPN*) MS-PCR	Blood			*x No. of test panel tested*
9	Angelman Syndrome (*UBE3A*) Sequencing	Blood			*x No. of test panel tested*
10	Angelman Syndrome (*UBE3A*) MLPA	Blood			*x No. of test panel tested*
11	Argininosuccinate Lyase Deficiency (*ASL*)	Blood			*x No. of test panel tested*
12	Argininosuccinate Synthase Deficiency (*ASS1*)	Blood			*x No. of test panel tested*
13	Aromatic Amino Acid Decarboxylase Deficiency (*DDC*)	Blood			*x No. of test panel tested*
14	Berardinelli Congenital Lipodystrophy (*BSCL2*)	Blood			*x No. of test panel tested*
15	Berardinelli Congenital Lipodystrophy (*AGPAT2*)	Blood			*x No. of test panel tested*
16	Biotinidase Deficiency (*BTD*)	Blood			*x No. of test panel tested*
17	BRCA-1 & 2	Blood			*x No. of test panel tested*
18	CADASIL (*NOTCH3*) - hotspots	Blood			*x No. of test panel tested*
19	Canavan Disease *(ASPA)*	Blood			*x No. of test panel tested*
20	Carbamoylphosphate Synthetase 1 Deficiency (*CPS1*)	Blood			*x No. of test panel tested*
21	Carnitine Update Deficiency (*OCTN2*)	Blood			*x No. of test panel tested*
22	Carnitine-Acylcarnitine Translocase Deficiency (*SLC25A20*)	Blood			*x No. of test panel tested*
23	Carnitine Palmitoyltransferase 1A (CPT1) Deficiency *(CPT1A)*	Blood			*x No. of test panel tested*
24	Carnitine Palmitoyltransferase II (CPT 2) Deficiency *(CPT2)*	Blood			*x No. of test panel tested*
25	Citrin Deficiency (*SLC25A13*)	Blood			*x No. of test panel tested*
26	Classical Homocystinuria (*CBS*)	Blood			*x No. of test panel tested*

27	Dihydropyrimidinase (DHP) Deficiency (*DPYS*)	Blood	*Total no. of specimens received.*		*x No. of test panel tested*
28	DNA Extraction & Storage	Blood			*x No. of test panel tested*
29	Ethylmalonic Encephalopathy (*ETHE1*)	Blood			*x No. of test panel tested*
30	Fragile X Syndrome (FRAXA) (*FMR1*)	Blood			*x No. of test panel tested*
31	Fragile X Syndrome (FRAXE) (*FMR2*)	Blood			*x No. of test panel tested*
32	Fructose-1,6-Bisphosphatase Deficiency (*FBP1*)	Blood			*x No. of test panel tested*
33	Fucosidosis (*FUCA1*)	Blood			*x No. of test panel tested*
34	Floating-Harbor Syndrome (FHS) (*SRCAP*)	Blood			*x No. of test panel tested*
35	Galactokinase Deficiency (*GALK1*)	Blood			*x No. of test panel tested*
36	Galactose Epimerase Deficiency (*GALE*)	Blood			*x No. of test panel tested*
37	Gaucher Disease (*GBA*)	Blood			*x No. of test panel tested*
38	Glutaric Aciduria Type 1 (*GCDH*)	Blood			*x No. of test panel tested*
39	Glycogen Storage Disease Type I (GSDI) (*G6P6*)	Blood			*x No. of test panel tested*
40	Glycogen Storage Disease Type I (GSDI) (*SLC37A4*)	Blood			*x No. of test panel tested*
41	Glycogen Storage Disease Type III (GSDIII) (*AGL*)	Blood			*x No. of test panel tested*
42	Hereditary Orotic Aciduria (*UMPS*)	Blood			*x No. of test panel tested*
43	Hypophosphatasia (*ALPL*)	Blood			*x No. of test panel tested*
44	Isolated Methyl Malonic Aciduria (MMA) (*MUT*)	Blood			*x No. of test panel tested*
45	Isolated Methyl Malonic Aciduria (MMA) (*MMAA*)	Blood			*x No. of test panel tested*
46	Isolated Methyl Malonic Aciduria (MMA) (*MMAB*)	Blood			*x No. of test panel tested*
47	Leber's hereditary optic neuropathy (LHON)	Blood			*x No. of test panel tested*
48	Leigh Syndrome (*SURF1*)	Blood			*x No. of test panel tested*
49	Leigh Syndrome (8993 hotspot)	Blood			*x No. of test panel tested*
50	Leigh Syndrome (mtDNA Full panel)	Blood			*x No. of test panel tested*
51	Leopard Syndrome (*PTPN11*)	Blood			*x No. of test panel tested*
52	Lesch-Nyhan Syndrome (*HPRT*)	Blood			*x No. of test panel tested*
53	Lissencephaly (*LIS1*)	Blood			*x No. of test panel tested*
54	Lissencephaly (*DCX*)	Blood			*x No. of test panel tested*
55	Long-Chain 3-Hydroxyacyl-CoA Dehydrogenase (*HADHA*)	Blood			*x No. of test panel tested*
56	Lysinuric Protein Intolerance (*SLC7A7*)	Blood			*x No. of test panel tested*
57	Maple Syrup Urine Disease (*BCKDHA*)	Blood			*x No. of test panel tested*

58	Maple Syrup Urine Disease (*BCKDHB*)				*x No. of test panel tested*
59	Maple Syrup Urine Disease (*DBT*)	Blood			*x No. of test panel tested*
60	Maple Syrup Urine Disease (*DLD*)	Blood			*x No. of test panel tested*
61	Maroteaux-Lamy Syndrome, MPS VI (*ARSB*)	Blood			*x No. of test panel tested*
62	MCT8-Specific Thyroid Hormone Cell Transporter Deficiency (*SLC16A2*)	Blood			*x No. of test panel tested*
63	Medium Chain Acyl-CoA Dehydrogenase (MCAD) Deficiency (*ACADM*)	Blood			*x No. of test panel tested*
64	Metachromatic Leukodystrophy (MLD) (*ARSA*)	Blood			*x No. of test panel tested*
65	Methylenetetrahydrofolate Reductase Deficiency (*MTHFR*)	Blood			*x No. of test panel tested*
66	Methylmalonic Aciduria and Homocystinuria, cbIC Type (*MMACHC*)	Blood			*x No. of test panel tested*
67	Methylmalonic Aciduria and Homocystinuria Type D (*MMADHC*)	Blood			*x No. of test panel tested*
68	Methylmalonyl-CoA Epimerase Deficiency (*MCEE*)	Blood			*x No. of test panel tested*
69	mtDNA Deletion Syndromes - Kearns-Sayre Syndrome (KSS) MLPA	Blood			*x No. of test panel tested*
70	mtDNA Deletion Syndromes - Pearson Syndrome MLPA	Blood			*x No. of test panel tested*
71	mtDNA Deletion Syndromes – Chronic Progressive External Ophthalmoplegia (CPEO) MLPA	Blood	*Total no. of specimens received.*		*x No. of test panel tested*
72	mtDNA Depletion Syndrome (MDS) Panel - *ANT1*	Blood			*x No. of test panel tested*
73	mtDNA Depletion Syndrome (MDS) Panel - *DGUOK*	Blood			*x No. of test panel tested*
74	mtDNA Depletion Syndrome (MDS) Panel - *MPV17*	Blood			*x No. of test panel tested*
75	mtDNA Depletion Syndrome (MDS) Panel - *POLG*	Blood			*x No. of test panel tested*
76	mtDNA Depletion Syndrome (MDS) Panel - *RRM2B*	Blood			*x No. of test panel tested*
77	mtDNA Depletion Syndrome (MDS) Panel – *SUCLA2*	Blood			*x No. of test panel tested*
78	mtDNA Depletion Syndrome (MDS) Panel – *SUCLG1*	Blood			*x No. of test panel tested*
79	mtDNA Depletion Syndrome (MDS) Panel – *TWINKLE*	Blood			*x No. of test panel tested*
80	mtDNA Depletion Syndrome (MDS) Panel – *TYMP*	Blood			*x No. of test panel tested*
81	Mitochondrial Encephalomyopathy, Lactic Acidosis, and Stroke-Like Episodes (MELAS) Syndrome (3243 hotspot)	Blood			*x No. of test panel tested*
82	Mitochondrial Encephalomyopathy, Lactic Acidosis, and Stroke-Like Episodes (MELAS) Syndrome (full panel)	Blood			*x No. of test panel tested*
83	Mitochondrial Short-Chain Enoyl-CoA Hydratase 1 Deficiency (*ECHS1*)	Blood			*x No. of test panel tested*
84	Morquio A Disease (MPS IVA) - *GALNS*	Blood			*x No. of test panel tested*
85	Multiple Respiratory Chain Deficiencies (Mitochondrial Translation Defect) (*GFM1*)	Blood			*x No. of test panel tested*

86	Myoclonic Epilepsy with Ragged-Red Fibers (*MERRF*) Syndrome	Blood			*x No. of test panel tested*
87	N-Acetylglutamate Synthase (NAGS) Deficiency (*NAGS*)	Blood			*x No. of test panel tested*
88	Neuropathy, Ataxia and Retinitis Pigmentosa (*NARP*) Syndrome	Blood			*x No. of test panel tested*
89	Non Ketotic Hyperglycinemia (NKH) (*AMT*)	Blood			*x No. of test panel tested*
90	Non Ketotic Hyperglycinemia (NKH) (*GCSH*)	Blood			*x No. of test panel tested*
91	Non Ketotic Hyperglycinemia (NKH) (*GLDC*) Sequencing	Blood			*x No. of test panel tested*
92	Non Ketotic Hyperglycinemia (NKH) (*GLDC*) MLPA	Blood			*x No. of test panel tested*
93	Noonan Syndrome (*PTPN11*)	Blood			*x No. of test panel tested*
94	Ornithine Transcarbamylase (OTC) Deficiency (*OTC*)	Blood			*x No. of test panel tested*
95	Phosphomannomutase 2 Deficiency (PMM2-CDG) (*PMM2*)	Blood			*x No. of test panel tested*
96	POLG-Related Disorders	Blood			*x No. of test panel tested*
97	Pompe Disease (*GAA*)	Blood			*x No. of test panel tested*
98	Prader-Willi Syndrome (*SNRPN*) MS-PCR	Blood			*x No. of test panel tested*
99	Primary Dystonia - THAP1 (*DYT6*)	Blood			*x No. of test panel tested*
100	Primary Dystonia – TOR1A (*DYT1*)	Blood	*Total no. of specimens received.*		*x No. of test panel tested*
101	Pseudorheumatoid Dysplasia (*WISP3*)	Blood			*x No. of test panel tested*
102	PTEN-associated Diseases (*PTEN*) Sequencing	Blood			*x No. of test panel tested*
103	PTEN-associated Diseases (*PTEN*) MLPA	Blood			*x No. of test panel tested*
104	Purine Nucleoside Phosphorylase Deficiency (*PNP*)	Blood			*x No. of test panel tested*
105	Pyruvate Dehydrogenase Deficiency (*PDHA1*)	Blood			*x No. of test panel tested*
106	Retinoblastoma (*RB1*) Sequencing	Blood			*x No. of test panel tested*
107	Retinoblastoma (*RB1*) MLPA	Blood			*x No. of test panel tested*
108	Schinzel Giedion Syndrome (*SETBP1*)	Blood			*x No. of test panel tested*
109	SCN1A-Related Seizure Disorders (*SCN1A*)	Blood			*x No. of test panel tested*
110	Severe Congenital Neutropenia (*ELANE*)	Blood			*x No. of test panel tested*
111	Short-Chain 3-Hydroxyacyl-CoA Dehydrogenase (SCHAD) Deficiency (HADH)	Blood			*x No. of test panel tested*
112	Spinal Muscular Atrophy (SMA) Sequencing	Blood			*x No. of test panel tested*
113	Spinal Muscular Atrophy (SMA) MLPA	Blood			*x No. of test panel tested*
114	Spinal Muscular Atrophy (SMA) PCR-RFLP	Blood			*x No. of test panel tested*
115	Sulfite Oxidase (SUOX) Deficiency (*SUOX*)	Blood			*x No. of test panel tested*

116	Tyrosine Hydroxylase Deficiency (*TH*)	Blood	*Total no. of specimens received.*		*x No. of test panel tested*
117	Very Long Chain Acyl-CoA Dehydrogenase (VLCAD) Deficiency (*ACADVL*)	Blood			*x No. of test panel tested*
118	Whole mitochondrial DNA (Full panel)	Blood			*x No. of test panel tested*
119	Whole mitochondrial DNA (mtDNA hotspots)	Blood			*x No. of test panel tested*
120	X-Chromosome Inactivation	Blood			*x No. of test panel tested*
121	X-linked Adrenoleukodystrophy (*ABCD1*)	Blood			*x No. of test panel tested*
122	Spinal Muscular Atrophy (SMN) Nuclear Gene Sequence	Blood/blood spot			*x No. of test panel tested*
123	Duchenne Muscular Dystrophy	Blood			*x No. of test panel tested*
124	Others (if test not listed)				*x No. of test panel tested for each test*
				TOTAL	

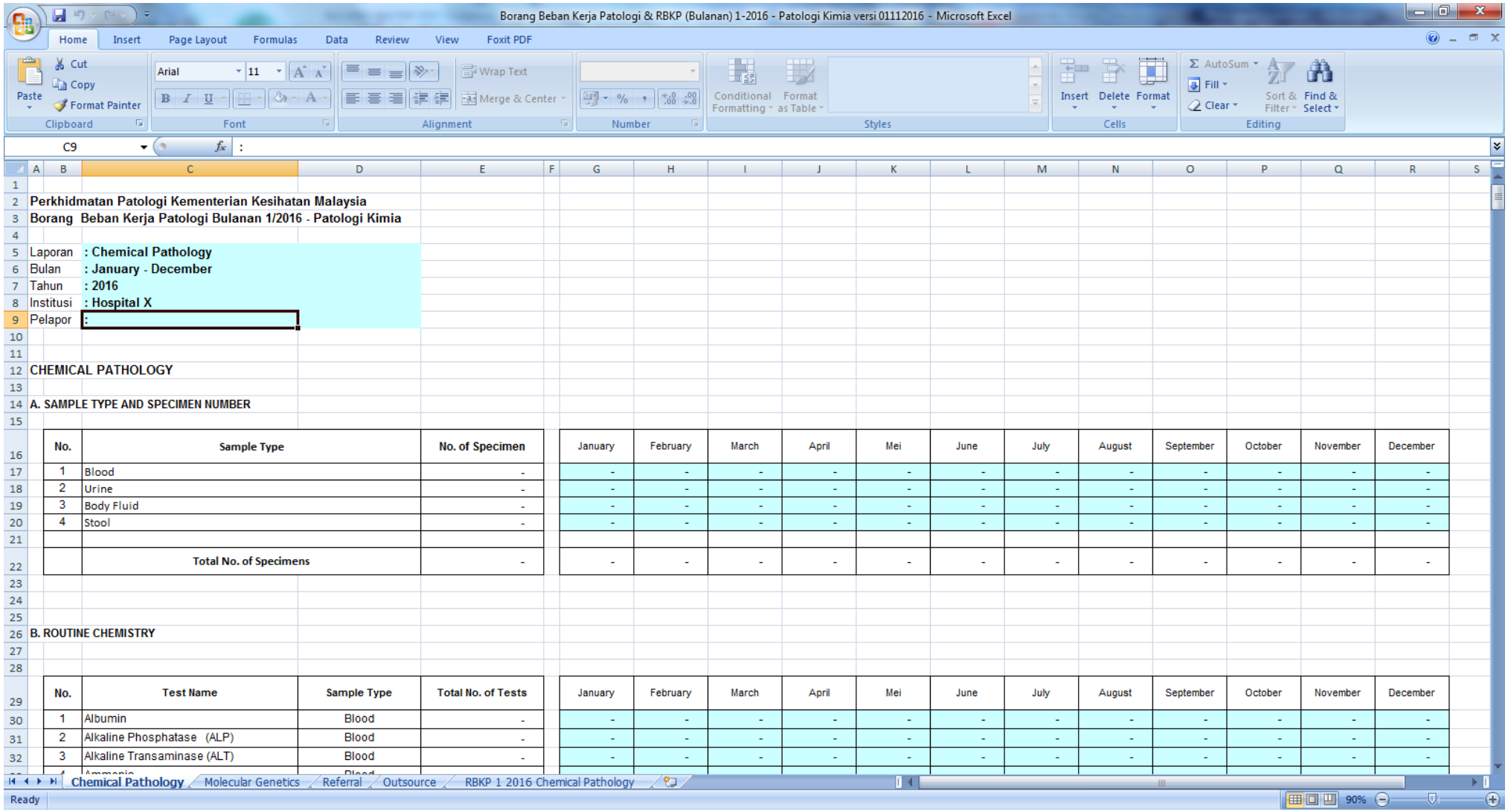
PATHOLOGY SERVICES
MINISTRY OF HEALTH, MALAYSIA

REPORT ON LABORATORY WORKLOAD: CHEMICAL PATHOLOGY

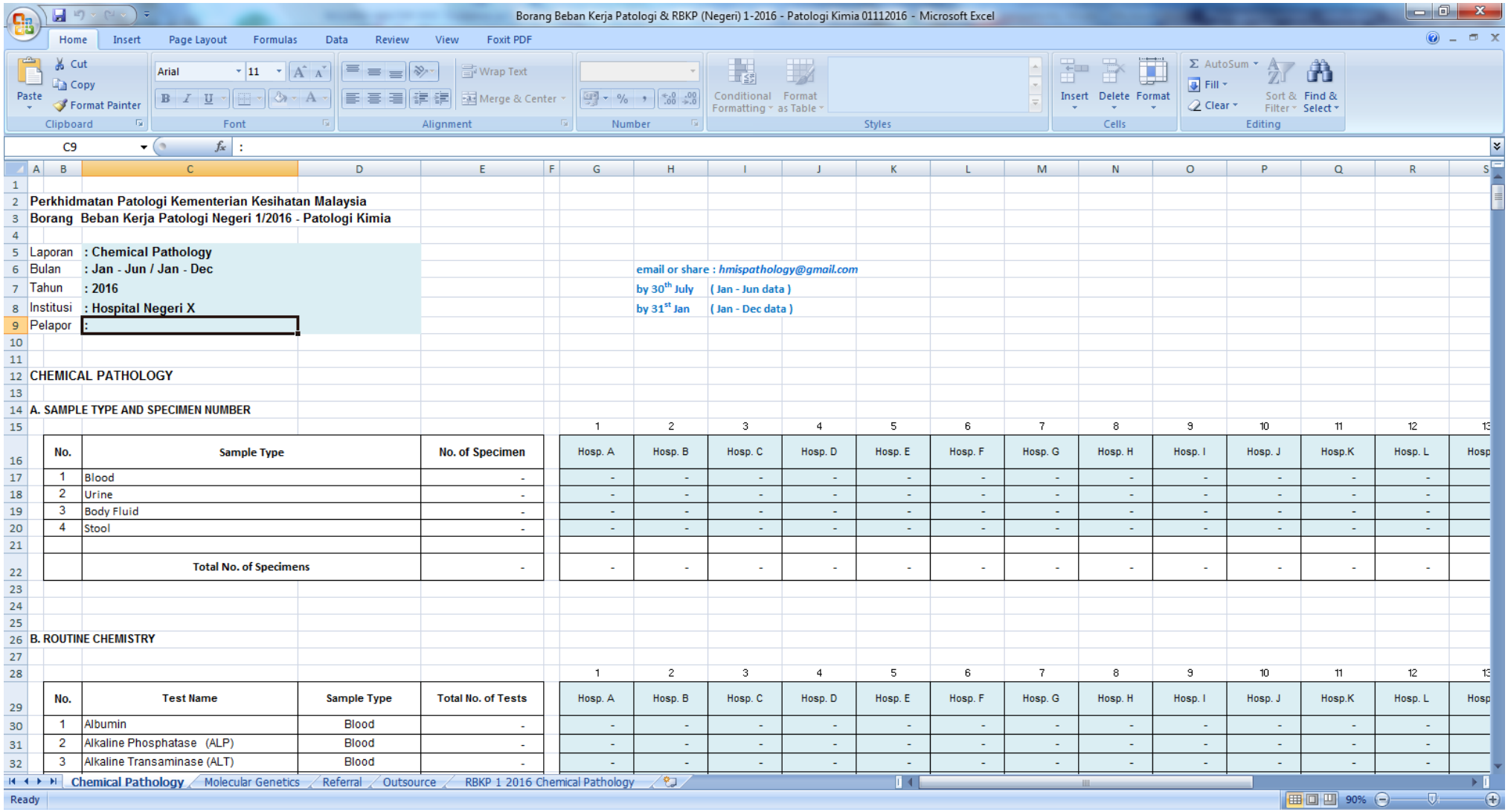
FOR THE OF MONTH: _____ YEAR : _____

Month or Location of Hospitals, Institutions and Public Health Facilities	Routine Chemistry	Endocroine & Metabolic	Cardiac Markers	Tumour Markers	Therapeutic Drug Monitoring (TDM)	Toxicology	Drug of Abuse (DOA)	Dynamic Function Test	Protein & Proteomic	Enzymology	Trace Elements	Biochemical Genetics	Molecular Genetics	Total No. of Specimens	Total No. of Tests

Borang Beban Kerja Patologi Bulanan 1/2016 – Patologi Kimia ('Excel Soft Copy')



Borang Beban Kerja Patologi Negeri 1/2016 – Patologi Kimia ('Excel Soft Copy')



7.3 HAEMATOLOGY

7.3.1 In addition to workload reporting to MOH using PER-SS 206 (Pin. 1/2000) form, hospital laboratories are also to submit to their respective State Pathologists in soft copy, detailed, as well as, summarised workload data on Haematology, using *Borang Beban Kerja Patologi Bulanan 1/2016 - Hematologi* and *Borang Ringkasan Beban Kerja Patologi 1/2016 - Hematologi,* respectively.

7.3.2 The total number of specimens received by a laboratory is calculated from the total number of specimens received across the designated groups.

7.3.3 Where more than one specimen are received for one particular test request, the number of specimens to be captured in the workload will depend on testing performed on these specimens; e.g. when peripheral blood and bone marrow aspirate (BMA) are received in 2 separate EDTA tubes from one patient for leukaemia/lymphoma immunophenotyping but the screening and confirmatory tests are performed on BMA only, the number of specimens received for this case is counted as one. The specimen that is not used for testing is disregarded.

7.3.4 Blood counts in profiles (e.g DIVC screening and acute leukaemia screening by immunophenotyping) and reticulocyte count in profiles (e.g Hb Analysis is) are counted under FBC and reticulocyte count in routine haematology. In almost all laboratories, the blood counts and automated reticulocyte counts in the profile tests are performed on the same routine FBC haematology analyzer. This will avoid duplication of data and helps to capture the true FBC workload.

7.3.5 Reticulocyte count is classified according to 2 methods i.e. automated or manual but similarly counted as one test.

7.3.6 Each profile test in general haematology and basic haemostasis and thrombosis is counted as a single profile test. However, the tests in these profiles (indicated by grey-coloured cells below) are individually counted within the designated group. Examples are blood and reticulocyte counts in FBP, and PT and APTT in DIVC screening. This will reflect the true workload of basic haematology services, which consist mainly of blood counts and are available in all laboratories in MOH hospitals and health clinics. Basic coagulation tests PT/INR and APTT are provided in all MOH hospitals.

7.3.7 Calculation of workload for profile tests in specialised haematology i.e. other than general haematology and basic haemostasis and thrombosis, is based on the individual tests in each profile. Any additional test is individually counted as one test in the profile e.g. for Hb Analysis, gel electrophoresis in alkaline phase is one test and in acid phase is one additional test. Every monoclonal antibody used in immunophenotyping is considered as one test.

7.3.8 Bone marrow aspiration as a single profile is counted as one test. Other than the routine stains, each additional cytochemical stain performed is individually counted as one test (including myeloperoxidase stain performed in leukaemia/lymphoma

immunophenotyping). Control slides (slides separately stained from test samples) are not counted to ensure more accurate workload data collection.

7.3.9 Processing of bone marrow trephine biopsy is performed in Histopathology lab. Their reports are however, included under Haematology specialists' reporting workload, if reported by Haematologists.

7.3.10 Workload calculation for ABO and Rhesus blood grouping (immunohaematology) is captured for primary healthcare services *(Klinik Kesihatan)* only.

7.3.11 The workload for cerebrospinal fluid (CSF) cytology testing (including cytospin) is captured depending on the local practices and the specialists reporting the test. In many laboratories, CSF cytospin for blasts is offered, performed and reported by haematopathologists, whether as an individual test or as part of screening in immunophenotyping in leukaemia/lymphoma. CSF cytology other than for blasts is under Cytology services.

7.3.12 The workload for molecular testing, is classified according to test method, i.e. manual, semi-automation or full automation.

7.3.13 For quantitative molecular testing in which, duplication of tests is mandatory for every primer, each primer used is countered as one test, regardless of the number of repeats.

7.3.14 Workload calculation for molecular tests, including molecular genetics, is based on every molecular defect or gene tested i.e. each molecular defect or gene tested is countered as one test.

7.3.15 Preanalytical workload (for 'non-test' technical activities) such as media preparation for transport and cell culture for cytogenetic test is captured mainly for the purpose of manpower requirement. It is however, not counted in the total number of tests performed.

7.3.16 Any test offered but is not in the list below, requires the workload submission to be temporarily included under 'others' and according to designated groups. Please inform National Pathology Workload Committee via Head of Discipline, of the test names that are to be added into the test list in *Borang Beban Kerja Patologi Bulanan 1/2016 - Hematologi* and *Borang Beban Kerja Patologi Negeri 1/2016 - Hematologi.*

7.3.17 Workload calculation and recording:

A. GENERAL HAEMATOLOGY

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
1	Blood Count	*No. of specimens received*	Haemoglobin (automated)	*x 1*
			3 parts Automated Full Blood Count (FBC)	*x 1*
			5 parts Automated Full Blood Count (FBC)	*x 1*
2	Slide review of abnormal FBC	*Not applicable*	Slide review of abnormal FBC	*x 1*
3	Reticulocyte count (RC)	*No. of specimens Received for each test*	Reticulocyte count (Automated)	*x 1*
			Reticulocyte (Manual)	
4	Erythrocyte Sedimentation Rate		Erythrocyte Sedimentation Rate	*x 1*
5	G6PD Screening		G6PD Screening	*x 1*
6	Full Blood Picture (FBP)	*No. of specimens received*	Automated Full Blood Count (FBC)	*Capture under FBC*
			Reticulocyte Count	*Capture under RC*
			Peripheral Blood Film (unstained slide)	*x 1*
			Peripheral Blood Film Morphology	*x 1*
7	Bone Marrow Aspiration	*No. of specimens received*	Smear /Trephine roll on routine stains Romanowsky stain : ● MGG stains	*x 1*
			● Perls' stains	*x 1*
8	Cytochemical stains :	*No. of specimens received*	● Acid Phosphatase	*x 1*
			● α -Naphthol Acetate Esterase	*x 1*
			● Chloracetate Esterase	*x 1*
			● Leucocyte/Neutrophil Alkaline phosphatase (LAP/NAP)	*x 1*
			● Myeloperoxidase	*x 1*
			● Naphthol AS Acetate Esterase	*x 1*
			● Periodic Acid-Schiff	*x 1*
			● Sudan Black B Stain	*x 1*
			● Tartrate Resistant Acid Phosphatase (TRAP)	*x 1*
9	Immunohaematology for **Klinik Kesihatan ONLY**			
	ABO & Rhesus Blood Grouping	*No. of specimens received*	● Anti-A	*x 1*
			● Anti-B	*x 1*
			● Anti-AB	*x 1*
			● Anti-D	*x 1*
			● A Cell	*x 1*
			● B Cell	*x 1*
			● O Cell	*x 1*
10	Others (if test not listed)		Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

B. BASIC HEMOSTASIS AND THROMBOSIS

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
1	Activated Partial Thromboplastin Time (APTT)	*No. of specimens received*	Activated Partial Thromboplastin Time (APTT)	*x 1*
2	APTT mixing test (substitution test)	*No. of specimens received*	APTT	*Capture under APTT*
			Initial mixing	*x 1*
			Additional test : 2 hours incubation mixing	*x 1*
3	DIVC screening	*No. of specimens received*	FBC	*x 1*
			Prothrombin Time (PT)	
			APTT	
			Fibrinogen (activity)	
			FDP/D-Dimer	
4	D-Dimer/FDP	*No. of specimens received for each test*	D-Dimer/FDP	*x 1*
5	Fibrinogen (activity)		Fibrinogen (activity)	*x 1*
6	Prothrombin time (PT/INR)		Prothrombin time (PT/INR)	*x 1*
7	PT mixing test (substitution test)		PT	*Capture under PT*
			Mixing	*x 1*
8	Thrombin time (TT)		Thrombin time (TT)	*x 1*
9	Others (if test not listed)		Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

C. SPECIALISED HEMOSTASIS AND THROMBOSIS

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
1	Activated Protein C Resistance	*No. of specimens received for each test*	Activated Protein C Resistance	*x 1*
2	ADAMTS 13 Activity		ADAMTS 13 Activity	*x 1*
3	ADAMTS 13 Antigen		ADAMTS 13 Antigen	*x 1*
4	Antithrombin		Antithrombin	*x 1*
5	Anti-Xa		Anti-Xa	*x 1*
6	Bleeding Time (BT)		Bleeding Time (BT)	*Capture under BT*
7	Coagulation Factor V Activity		Coagulation Factor V Activity	*x 1*
8	Coagulation Factor V Antigen		Coagulation Factor V Antigen	*x 1*
9	Coagulation Factor V Assay	*No. of specimens received for each test*	PT	*Capture under PT*
			APTT	*Capture under APTT*
			Mixing tests	*Capture under mixing test (APTT)*
			Factor V Activity	*Capture under Factor V Activity*
10	Coagulation Factor V Inhibitors		PT	*Capture under PT*
			APTT	*Capture under APTT*

		No. of specimens received for each test	Mixing tests	*Capture under mixing test (APTT)*
			Dilution in Parallelism study	*x 1 for each dilution*
			Dilution in Inhibitor-Bethesda assay	*x 1 for each dilution*
11	Coagulation Factor VII Activity		Coagulation Factor VII Activity	*x 1*
12	Coagulation Factor VII Antigen		Coagulation Factor VII Antigen	*x 1*
13	Coagulation Factor VII Assay	*No. of specimens received*	PT	*Capture under PT*
			Mixing tests	*Capture under mixing test (PT)*
			Factor VII Activity	*Capture under Factor VII Activity*
14	Coagulation Factor VII Inhibitors	*No. of specimens received*	PT	*Capture under PT*
			Mixing tests	*Captured under mixing test (PT)*
			Dilution in Parallelism study	*x 1 for each dilution*
			Dilution in Inhibitor-Bethesda assay	*x 1 for each dilution*
15	Coagulation Factor VIII Activity	*No. of specimens received each test*	Coagulation Factor VIII Activity	*x 1*
16	Coagulation Factor VIII Antigen		Coagulation Factor VIII Antigen	*x 1*
17	Coagulation Factor VIII Assay		APTT	*Capture under APTT*
			Mixing tests	*Capture under mixing test (APTT)*
			Factor VIII Activity	*Capture under Factor VIII Activity*
18	Coagulation Factor VIII Inhibitors	*No. of specimens received*	PT	*Capture under PT*
			Mixing tests	*Capture under mixing test (PT)*
			Dilution in Parallelism study	*x 1 for each dilution*
			Dilution in Inhibitor-Bethesda assay	*x 1 for each dilution*
19	Coagulation Factor IX Activity	*No. of specimens received each test*	Coagulation Factor IX Activity	*x 1*
20	Coagulation Factor IX Antigen		Coagulation Factor IX Antigen	*x 1*
21	Coagulation Factor IX Assay		APTT	*Capture under APTT*
			Mixing tests	*Capture under mixing test (APTT)*
			Factor IX Activity	*Capture under Factor IX Activity*
22	Coagulation Factor IX Inhibitors	*No. of specimens received*	APTT	*Capture under APTT*
			Mixing tests	*Capture under mixing test (APTT)*

		No. of specimens received for each test	Dilution in Parallelism study	*x 1 for each dilution*
			Dilution in Inhibitor-Bethesda assay	*x 1 for each dilution*
23	Coagulation Factor X Activity		Coagulation Factor X Activity	*x 1*
24	Coagulation Factor X Antigen		Coagulation Factor X Antigen	*x 1*
25	Coagulation Factor X Assay	*No. of specimens received*	PT	*Capture under PT*
			APTT	*Capture under APTT*
			Mixing tests	*Capture under mixing test (APTT)*
			Factor X Activity	*Capture under Factor X Activity*
26	Coagulation Factor X Inhibitors	*No. of specimens received*	PT	*Capture under PT*
			APTT	*Capture under APTT*
			Mixing tests	*Capture under mixing test (APTT)*
			Dilution in Parallelism study	*x 1 for each dilution*
			Dilution in Inhibitor-Bethesda assay	*x 1 for each dilution*
27	Coagulation Factor XI Activity	*No. of specimens received each test*	Coagulation Factor XI Activity	*x 1*
28	Coagulation Factor XI Antigen		Coagulation Factor XI Antigen	*x 1*
29	Coagulation Factor XI Assay		APTT	*Capture under APTT*
			Mixing tests	*Capture under mixing test (APTT)*
			Factor XI Activity	*Capture under Factor XI Activity*
30	Coagulation Factor XI Inhibitors	*No. of specimens received*	APTT	*Capture under APTT*
			Mixing tests	*Capture under mixing test (APTT)*
			Dilution in Parallelism study	*x 1 for each dilution*
			Dilution in Inhibitor-Bethesda assay	*x 1 for each dilution*
31	Coagulation Factor XII Activity	*No. of specimens received each test*	Coagulation Factor XII Activity	*x 1*
32	Coagulation Factor XII Antigen		Coagulation Factor XII Antigen	*x 1*
33	Coagulation Factor XII Assay		APTT	*Capture under APTT*
			Mixing tests	*Capture under mixing test (APTT)*
			Factor XII Activity	*Capture under Factor XII Activity*
34	Coagulation Factor XII Inhibitors		APTT	*Capture under APTT*

		No. of specimens received each test	Mixing tests	*Capture under mixing test (APTT)*
			Dilution in Parallelism study	*x 1 for each dilution*
			Dilution in Inhibitor-Bethesda assay	*x 1 for each dilution*
35	Coagulation Factor XIII Activity		Coagulation Factor XIII Activity	*x 1*
36	Coagulation Factor XIII Antigen		Coagulation Factor XIII Antigen	*x 1*
37	Coagulation Factor XIII Inhibitors	*No. of specimens received*	PT	*Capture under PT*
			APTT	*Capture under APTT*
			Dilution in Parallelism study	*x 1 for each dilution*
			Dilution in Inhibitor-Bethesda assay	*x 1 for each dilution*
38	Coagulation Factor XIII Screening	*No. of specimens received*	Coagulation Factor XIII Clot Lysis Test/Screening	*x 1*
39	Coagulation profile	*No. of specimens received*	Bleeding Time	*Capture under BT*
			FBC (Hb & Platelet count)	*Capture under FBC*
			Fibrinogen	*Capture under Fibrinogen*
			PT	*Capture under PT*
			APTT	*Capture under APTT*
			Thrombin Time	*Capture under TT*
			D-Dimer	*Capture under D-Dimer*
40	Coagulation Tissue factor	*No. of specimens received for each test*	Coagulation Tissue Factor	*x 1*
41	Euglobulin Clot Lysis		Euglobulin Clot Lysis	*x 1*
42	Fibrin and Fibrinogen degradation product (FDP)		Fibrin and Fibrinogen degradation product (FDP)	*x 1*
43	Fibrin Monomer		Fibrin Monomer	*x 1*
44	Fibrinogen Antigen		Fibrinogen Antigen	*x 1*
45	Fibrinogen Activity		Fibrinogen Activity	*x 1*
46	Heparin induced thrombocytopaenia test		Platelet Factor 4	*x 1*
			Serotonin Assay	*x 1*
			Platelet Aggregation for HIT	*x 1 per agonist*
47	Kininogen High Molecular Weight		Kininogen High Molecular Weight	*x 1*
48	Lupus anticoagulant screen	*No. of specimens received*	Prothrombin Time	*Capture under PT*
			APTT (LA Sensitive)	*x 1*
			DRVVT Screening	*x 1*
			Silica Clotting Time screen	*x 1*
			Kaolin Clotting Time	*x 1*

49	Lupus anticoagulant confirm	*No. of specimens received*	DRVVT Confirm	*x 1*
			Platelet Neutralization Test (PNT)	*x 1*
			Silica Clotting Time confirm	*x 1*
			Hexagonal Phosphatidyl etanolamin (HPE)	*x 1*
50	Plasmin Inhibitor	*No. of specimens received for each test*	Plasmin Inhibitor	*x 1*
51	Plasminogen		Plasminogen	*x 1*
52	Plasminogen Activator Inhibitor 1 (PAI 1)		Plasminogen Activator Inhibitor 1 (PAI 1)	*x 1*
53	Platelet aggregation test		Platelet aggregation test (Agonists : ADP/Collagen etc)	*x 1 per agonist*
54	Platelet function tests	*No. of specimens received*	Bleeding Time	*Capture under BT*
			Clot Retraction	*x 1*
			Platelet Marker - 1 test per MoAb used :	
			● CD 41a	*x 1*
			● CD 42b	*x 1*
			Platelet aggregation test : 1 test per agonist used	
			● ADP	*x 1*
			● Collagen	*x 1*
			● Ristocetin	*x 1*
			● Arachidonic acid	*x 1*
			● Epinephrine	*x 1*
55	Platelet Factor 3	*No. of specimens received for each test*	Platelet Factor 3	*x 1*
56	Platelet Factor 4		Platelet Factor 4	*x 1*
57	Platelet Function Analysis (PFA 100)		Platelet Function Analysis (PFA 100)	*x 1 per marker*
58	Platelet Antibody		Platelet Antibody	*x 1*
59	Protein C Activity		Protein C Activity	*x 1*
60	Protein C Antigen		Protein C Antigen	*x 1*
61	Protein S Antigen		Protein S Antigen	*x 1*
62	Protein S, Free		Protein S, Free	*x 1*
63	Protein S, Total		Protein S, Total	*x 1*
64	Prothrombin Antigen		Prothrombin Antigen	*x 1*
65	Prothrombin Fragment 1& 2		Prothrombin Fragment 1& 2	*x 1*
66	Reptilase Test		Reptilase Test	*x 1*
67	Thromboglobulin, Beta		Thromboglobulin, Beta	*x 1*
68	Thrombomodulin		Thrombomodulin	*x 1*
69	Thrombophilia screening	*No. of specimens received*	Lupus Anticoagulant	*Capture under Lupus Anticoagulant*
			Antithrombin Antigen	*x 1*
			Antithrombin Activity	*x 1*
			Protein C Activity	*Capture under Protein C Activity*
			Protein S, Total	*Capture under Protein S, Total*
			Protein S, Free	*Capture under Protein S, Free*
			Activated Protein C Resistance with Factor V (Normal Plasma)	*x 1*

			Factor VIII : C Activity	*Capture under Factor VIII Activity*
			Plasma Homocysteine Level	*x 1*
			Heparin Cofactor II	*x 1*
			Plasminogen Level	*x 1*
			Fibrinogen	*Capture under Fibrinogen*
			D-Dimer	*Capture under D-Dimer*
70	von Willebrand Ristocetin Cofactor assay	*No. of specimens received for each test*	von Willebrand Ristocetin Cofactor assay	*x 1*
71	von Willebrand Factor (vWF) Activity		von Willebrand Factor (vWF) Activity	*x 1*
72	von Willebrand Factor (vWF) Antigen	*No. of specimens received for each test*	von Willebrand Factor (vWF) Antigen	*x 1*
73	vWF collagen binding assay		vWF collagen binding assay	*x 1*
74	von Willebrand Multimers Analysis		von Willebrand Multimers Analysis	*x 1*
75	von Willebrand disease profile	*No. of specimens received*	APTT	*Capture under APTT*
			vWF: Ag	*Capture under vWF: Ag*
			vWF: Activity	*Capture under vWF: Activity*
			Coagulation Factor VIII Activity	*x 1*
			vWF:CB	*x 1*
			vWF:Rco	*x 1*
			Additional tests (Subtyping) :	
			● vWF Factor VIII Binding assay	*x 1*
			● Ristocetin Induced platelet agglutination (RIPA)	*x 1*
			● *M*ultimeric analysis	*x 1*
76	Warfarin Level	*No. of specimens received for each test*	Warfarin Level	*x 1*
77	Others (if test not listed)		Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

D. RED CELL DISORDERS

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
1	Autohaemolysis test	*No. of specimens received for each test*	Autohaemolysis test	*x 1*
2	G6PD Activity		G6PD Activity	*x 1*
3	Heinz Bodies		Heinz Bodies	*x 1*
4	Ham test		Ham test	*x 1*
5	Methaemoglobin reduction test		Methaemoglobin reduction test	*x 1*
6	Osmotic Fragility Test		Osmotic Fragility Test	*x 1*
7	Pyruvate Kinase Activity		Pyruvate Kinase Activity	*x 1*
8	Schumm test		Schumm test	*x 1*
9	Sucrose Lysis Test		Sucrose Lysis Test	*x 1*
10	Others (if test not listed)	*No. of specimens received*	Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

E. HAEMOGLOBIN DISORDERS

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
1	Hb Analysis (Basic tests)	*No. of specimens received*	Automated Blood Count	*Capture under FBC*
			Reticulocyte count	*Capture under reticulocyte count*
			Peripheral Blood Film (unstained slide)	*Capture under peripheral blood film (unstained slide)*
			Peripheral Blood Film Morphology	*x 1*
			Hb quantification (HPLC or Hb Capillary electrophoresis)	*x 1*
			H inclusion	*x 1*
			HPLC	*x 1*
	Hb Analysis (Additional tests)	*No. of specimens received*	Hb Capillary Electrophoresis	*x 1*
			Hb Electrophoresis (alkaline)	*x 1*
			Hb Electrophoresis (acid)	*x 1*
2	Haemoglobin, Urine	*No. of specimens received for each test*	Haemoglobin, Urine	*x 1*
3	Haemoglobin Fetal (Kleihauer test)		Haemoglobin Fetal (Kleihauer test)	*x 1*
4	Haemoglobin, Thermolabile (Unstable Hb)		Haemoglobin, Thermolabile (Unstable Hb)	*x 1*
5	Sickling Test		Sickling Test	*x 1*
6	Others (if test not listed)		Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

F. IMMUNOPHENOTYPING

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
1	Fetal red cells (HbF) quantitation	*No. of specimens received*	Fetal red cells (HbF) quantitation	*x 1*
2	Cerebral spinal fluid (CSF) for blasts	*No. of specimens received*	CSF cytospin	*x 1*
			Immunophenotyping	*X MoAb used*
3	Acute Leukaemia Immunophenotyping : Basic screening	*No. of specimens received*	FBC	*Capture under FBC*
			Blood film	*x 1*
			Bone Marrow Film	*x 1*
			CSF cytospin	*x 1*
			Body Fluid cytospin	*x 1*
			Acute Leukemia screening (SA)	*x MoAb used*
			Cell Viability	*x 1*
	Acute leukaemia immunophenotyping : Diagnostic panel		Myeloperoxidase (MPO)	*Capture under MPO*
			B Cell - Acute Lymphoblastic Leukemia (B-ALL)	*x MoAb used*
			T Cell - Acute Lymphoblastic Leukemia (T-ALL)	*x MoAb used*
			Acute Myeloblastic Leukemia (AML)	*x MoAb used*
4	Lymphoproliferative disorder/ Lymphoma Immunophenotyping: Basic screening	*No. of specimens received*	FBC	*Capture under FBC*
			Blood film	*x 1*
			Bone Marrow Film	*x 1*
			CSF cytospin	*x 1*
			Body Fluid cytospin	*x 1*
			LPD/ Lymphoma screening (SL)	*x MoAb used*
			Cell Viability	*x 1*
	Lymphoproliferative disorder/ Lymphoma Immunophenotyping: Diagnostic panel		B - Cell Lymphoproliferative Disorder (B-LPD)	*x MoAb used*
			T - Cell Lymphoproliferative Disorder (T-LPD)	*x MoAb used*
			Natural Killer Cell (NK)	*x MoAb used*
5	Multiple Myeloma Immunophenotyping :Basic screening	*No. of specimens received*	FBC	*Capture under FBC*
			Blood film	*x 1*
			Bone Marrow Film	*x 1*
			Multiple Myeloma Screening (SM)	*x MoAb used*
			Cell Viability	*x 1*
	Multiple Myeloma Immunophenotyping : Additional		Multiple Myeloma (MM) panel	*x MoAb used*
6	Residual disease of acute leukaemia Immunophenotyping (for B-ALL)	*No. of specimens received*	FBC	*Capture under FBC*
			Blood film	*x 1*
			Bone Marrow Film	*x 1*
			B-ALL MRD panel	*x MoAb used*
			Cell Viability	*x 1*

7	Residual disease of acute leukaemia Immunophenotyping (for T-ALL)	*No. of specimens received*	FBC	*Capture under FBC*
			Blood film	*x 1*
			Bone Marrow Film	*x 1*
			T-ALL MRD panel	*x MoAb used*
			Cell Viability	*x 1*
8	Residual disease of acute leukaemia Immunophenotyping (for AML)	*No. of specimens received*	FBC	*Capture under FBC*
			Blood film	*x 1*
			Bone Marrow Film	*x 1*
			AML MRD panel	*x MoAb used*
			Cell Viability	*x 1*
9	CD4/CD8 Count (Single platform)	*No. of specimens received*	CD3/4/8/45	*x MoAb used*
	CD4/CD8 Count (Dual platform)	*No. of specimens received*	FBC	*Capture under FBC*
			CD3/4/8/45	*x MoAb used*
10	Neutrophil activation	*No. of specimens received*	e.g.CD64	*x MoAb used*
11	Platelets Glycoproteins Immunophenotyping	*No. of specimens received*	As per number of monoclonal antibodies (MoAb) used	*x MoAb used*
12	Paroxysmal nocturnal haemoglobinuria (PNH) Immunophenotyping	*No. of specimens received*	FBC	*Capture under FBC*
			PNH Clone in White cells	*x MoAb used*
			PNH Clone in red cells	*x MoAb used*
13	Others (if test not listed)	*No. of specimens received*	Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

G. MOLECULAR DIAGNOSIS FOR NON MALIGNANT HAEMATOLOGY

Method Classification* :
M: Manual
S: Semi automation
F: Full automation

No.	Type of Tests	No. Specimens		Tests Performed (M / S / F)*		No. Test performed
1	Molecular tests for G6PD genotyping	*No. of specimens received*		As per type of molecular defect tested e.g. ● Viangchan variant ● Canton variant ● Mahidol variant ● Kaiping variant		*x Molecular defect tested*
2	Molecular tests for Haemophilia	*No. of specimens received*		As per type of molecular defect tested e.g. ● Intron 1 inversion ● Intron 22 inversion		*x Molecular defect tested*
3	Molecular tests for Thalassaemia /Haemoglobinopathy					
3.1	Molecular tests for Beta-globin gene defects	*No. of specimens received*	Beta-globin gene - 11 parts	β Multiplex Gap-PCR (deletional mutation)		*x Molecular defect tested*
				β Mgap 2 (HPFH-3, Chinese, Asian)		
				β Multiplex ARMS-PCR e.g.	-88 [C>T] (β^+)	*x Molecular defect tested*
					-86 [C>G] (β^+)	
					-29 [A>G] (β^+)	
					-28 [A>G] (β^+)	
					Cap+1 [A>C] (β^+)	
					Initiation codon [A*T*G>A*G*G] (β°)	
					Codon 8/9 [+G] (β°)	
					Codon 15 [T*G*G>T*A*G] (β°)	
					Codon 16 [GGC>GG-] (β°)	
					Codon 17 [*A*AG>*T*AG] (β°)	
					Codon 19 [A*A*C>A*G*C] Malay (β^+)	
					Codon 26 [*G*AG>*A*AG] Hb E (β^E)	
					IVS 1-1 [G>T] (β°)	
					IVS 1-1 [G>A] (β°)	
					IVS 1-5 [G>C] (β^+)	

					Codon 41/42 [-TTCT] (β°)	
					Codon 43[*G*AG>*T*AG](β°)	
					Codon 71/72 [+A] (β°)	
					IVS 2-654 [C>T] (β^+)	
					Poly A [AATA*A*A >AATAG*A*] (β^+)	
					619bp deletion	
				β FIL deletion		*x Molecular defect tested*
				Singleplex β sequencing PCR		
				β Sequencing (4 reactions /sample)	PCO7_F	*x Molecular defect tested*
					PCO_R	
					833_1338	
					PAA_R	
					CA	
					Common F	
					B minus 296_Fw	
				β MLPA		*x Molecular defect tested*
				Chinese $^{G}\gamma(^{A}\gamma\delta\beta)$ Multiplex Gap-PCR		
				Asian-Indian Del/Inv $^{G}\gamma(^{A}\gamma\delta\beta)$ Multiplex-Gap PCR		
				Hb Lepore Multiplex Gap-PCR		
				β Multiplex ARMS-PCR for HbS		
				β Multiplex ARMS-PCR for HbD Punjab		
				β Multiplex ARMS-PCR for HbC		
				Mgap Hb Lepore Variant (Hb Lepore Hollandia, Hb Lepore Baltimore, Hb Lepore Washington-Boston)		
				XmnI polymorphism (RFLP-PCR)		
3.2	Molecular tests for Alpha globin gene defects	*No. of specimens received*	Alpha globin gene – 6 parts	α Multiplex Gap-PCR (deletional mutation) e.g	Single gene deletion $-\alpha^{3.7}$	*x Molecular defect tested*
					Single gene deletion $-\alpha^{4.2}$	
					Double genes deletion $--^{SEA}$	
					Double genes deletion $--^{FIL}$	
					Double genes deletion $--^{THAI}$	

					Double genes deletion --^{MED}	
					Double genes deletion --(□)$^{20.5}$	
				α Multiplex ARMS-PCR e.g.	Initiation codon (ATG>A_G)	*x Molecular defect tested*
					Codon 30 (∆GAG)	
					Codon 35 (TCC→CCC)	
					Codon 59 (GGC→GAC)	
					Codon 125 (CTG→CCG) or Hb Quong Sze	
					Termination codon (TAA→CAA) or Hb constant spring	
				Singleplex α sequencing PCR (HBA1 and HBA2 gene)		*x Molecular defect tested*
				α sequencing (covers α1 and α2 gene; 8 reactions/ sample)	AC40_R	*x Molecular defect tested*
					BE17_R	
					BE10_F	
					AD_F	
					AC40_R	
					BE12_R	
					BE10_R	
					AD_F	
				α MLPA		*x Molecular defect tested*
				α triplication PCR		
				α Multiplex ARMS-PCR for Hb Pakse		
4	Molecular tests for Thrombophilia	*No. of specimens received*	As per type of molecular defect tested e.g. ● FV Leiden mutation ● PT20210A mutation			*x Molecular defect tested*
5	Molecular tests for von Willebrand disease	*No. of specimens received*	As per type of molecular defect tested e.g. ● Single cytosine deletion in exon 18 ● Nonsense mutation in exons 28 ● Nonsense mutation in exons 15			*x Molecular defect tested*
6	Others (if test not listed)	*No. of specimens received*	Each indivdual test			*x Molecular defect tested*
	TOTAL		**TOTAL**			

H. MOLECULAR DIAGNOSIS FOR MALIGNANT HAEMATOLOGY

Method Classification*:
M: Manual
S: Semi automation
F: Full automation

No.	Type of Tests	No. Specimens	Tests Performed (M / S / F)*		No. Test performed
1	Molecular tests for leukaemia : Screening	*No. of specimens received*	RNA quantification		*x 1*
			Master Screening		*x Molecular defect tested*
	Molecular tests for leukaemia : Confimation		Split Out Analysis		*x Molecular defect tested*
2	Acute myeloid leukaemia mutation studies	*No. of specimens received*	AML mutation studies (PCR & Sequencing) e.g.	FLT-3	*x Molecular defect tested*
				NPM1	
				CEBPA	
				c-KIT	
				CBF□ □ /MYH11	
				RUNX1/RUNX1T1	
3	Acute lymphoid leukaemia mutation studies	*No. of specimens received*	ALL mutation studies (PCR & Sequencing) e.g.	ETV6-RUNX1	*x Molecular defect tested*
4	Molecular tests for Lymphoma	*No. of specimens received*	As per type of molecular defect to be detected e.g. ● BCL2 rearrangement ● MYC translocation		*x Molecular defect tested*
5	Myeloproliferative Neoplasm Mutation Sudy: Basic screening	*No. of specimens received*	DNA quantification		*x 1*
			JAK2V617F (JAK2 Mutation)		*x Molecular defect tested*
	Myeloproliferative Neoplasm Mutation Study: Additional tests	*No. of specimens received*	JAK 2 exon 12		*x Molecular defect tested*
			MPL W515L/K		
			CALR		
6	PML RARA qualitative	*No. of specimens received*	FBC		*Capture under FBC*
			RNA quantification		*x 1*
			PML-RARA qualitative		*x Molecular defect tested*
7	PML RARA quantitative	*No. of specimens received*	FBC		*Captured under FBC*
			RNA quantification		*1 test*
			PML-RARA quantification		*x Molecular defect tested*

8	BCR-ABL qualitative	*No. of specimens received*	FBC	*Capture under FBC*
			RNA quantification	*1 test*
			BCR-ABL qualitative	*x molecular defect tested*
9	BCR-ABL quantitative	*No. of specimens received*	FBC	*Captured under FBC*
			RNA quantification	*x 1*
			BCR-ABL quantification	*x Molecular defect tested*
10	Chronic myeloid leukaemia mutation studies	*No. of specimens received*	DNA quantification	*x 1*
			CML mutation studies e.g T315I mutation detection	*x Molecular defect tested*
11	MRD for B-ALLL	*No. of specimens received*	FBC	*Captured under FBC*
			RNA quantification	*x 1*
			Specific marker quantification	*x Molecular defect tested*
12	MRD for T-ALLL	*No. of specimens received*	FBC	*Captured under FBC*
			RNA quantification	*x 1*
			Specific marker quantification	*x Molecular defect tested*
13	MRD for AML	*No. of specimens received*	FBC	*Captured under FBC*
			RNA quantification	*x 1*
			Specific marker quantification	*x Molecular defect tested*
14	Others (if test not listed)	*No. of specimens received*	Each indivdual test	*x Molecular defect tested*
	TOTAL		**TOTAL**	

I. GENETICS FOR HAEMATOLOGICAL DISORDER

Method Classification*:
M: Manual
S: Semi automation
F: Full automation

No.	Type of Tests	No. Specimens	Tests Performed (M / S / F)*	No. Test performed
1	Chromosomal microarray	*No .of specimens received for each tests*	Array CGH analysis	*x 1*
2	Chromosome Analysis		Chromosome Analysis	*x 1*
3	Chromosome Breakages, Fanconi's Anaemia		Chromosome Breakages, Fanconi's Anaemia	*x 1*

4	Genetic linkage analysis for Haemophilia A	*No .of specimens received*	As per marker used e.g ● Hind III ● ST 14 ● CA13 VNTR ● CA22 VNTR	*x Molecular defect tested*
5	Molecular genetic BCR-ABL	*No .of specimens received for each tests*	Fluorescence-in-situ hybridization (FISH), BCR-ABL	*x 1*
6	Molecular genetic RARA		Fluorescence-in-situ hybridization (FISH), RARA	*x 1*
7	Molecular genetic PML-RARA		Fluorescence-in-situ hybridization (FISH), PML/RARA	*x 1*
8	Molecular genetic ETV6-RUNX1	*No. of specimens received*	Fluorescence-in-situ hybridization (FISH), ETV6-RUNX1	*x 1*
9	Others (if test not listed)	*No. of specimens received*	Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

J. STEM CELL TRANSPLANTATION

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
1	Cell Viability	*No. of specimens received*	Cell Viability	*x 1*
2	CD 34 count of bone marrow, PBSC, cord blood	*No. of specimens received*	FBC	*Capture under FBC*
			CD34	*x 1*
			Cell Viability	*x 1*
3	CD 34 count for tranplant without processing (bone marrow /PBSC/Donor lymphocyte)	*No. of specimens received*	FBC	*Capture under FBC*
			Blood film morphology	*x 1*
			CD34	*x 1*
			CD3 Cells	*x 1*
			Cell viability	*x 1*
4	CD 34 count for stem cell processing (bone marrow/ PBSC/ cord blood/Donor lymphocyte)	*No. of specimens received*	FBC pre processing	*Capture under FBC*
			FBC post processing	*Capture under FBC*
			Blood film morphology	*x 1*
			CD34 pre processing	*x 1*
			CD34 post processing	*x 1*
			CD3 Cells pre processing	*x 1*
			CD3 Cells post processing	*x 1*
			Cell viability pre processing	*x 1*
			Cell viability post processing	*x 1*

	Additional Stem cell processing or test	*No. of specimens received*	Culture & sensitivity test pre & post processing	*Capture under Microbiology*
			Stem cell Cryopreservation	*x 1*
			Donor Lymphocyte Cryopreservation	*x 1*
			Red Cell Depletion Procedure	*x 1*
			Stem Cell (CD34) Selection Procedure	*x 1*
			T Cell Depletion Procedure	*x 1*
			HLA Typing of cord blood	*Workload capture by referral labs (IMR/PDN)*
5	Infusion of cryopreserved stem cell/ donor lymphocytes	*No. of specimens received for each test*	Infusion of cryopreserved stem cell	*x 1*
			Infusion of cryopreserved donor lymphocytes	*x 1*
6	CFU for stem cell		CFU for stem cell	*x 1*
7	Chimerism studies (STR) : Diagnostic panel		Donor allele identification	*x Molecular markers tested*
			Pre-Recipient alelle identification	*x Molecular markers tested*
			1st Post-Recipient STR asessment	*x Molecular markers tested*
8	Chimerism studies (STR) : Follow up panel		1st Post-Recipient STR asessment	*x Molecular markers tested*
			FBC	*Captured under FBC*
9	Chimerism studies (Real-time PCR)		Real-time PCR – Genotyping	*x Molecular markers tested*
			Real-time PCR - Quantitation of chimerism	*x Molecular markers tested*
10	Others (if test not listed)	*No. of specimens received*	Each indivdual test	*x Molecular markers tested*
	TOTAL		**TOTAL**	

PREANALYTICAL WORKLOAD (FOR 'NON-TEST' TECHNICAL ACTIVITIES)

Activity	Workload
Cytogenetic Cell culture	Number of test tubes
Cytogenetic transport media	Number of test tubes
Cytogenetic slide preparation	Number of slides

PATHOLOGY SERVICES
MINISTRY OF HEALTH, MALAYSIA

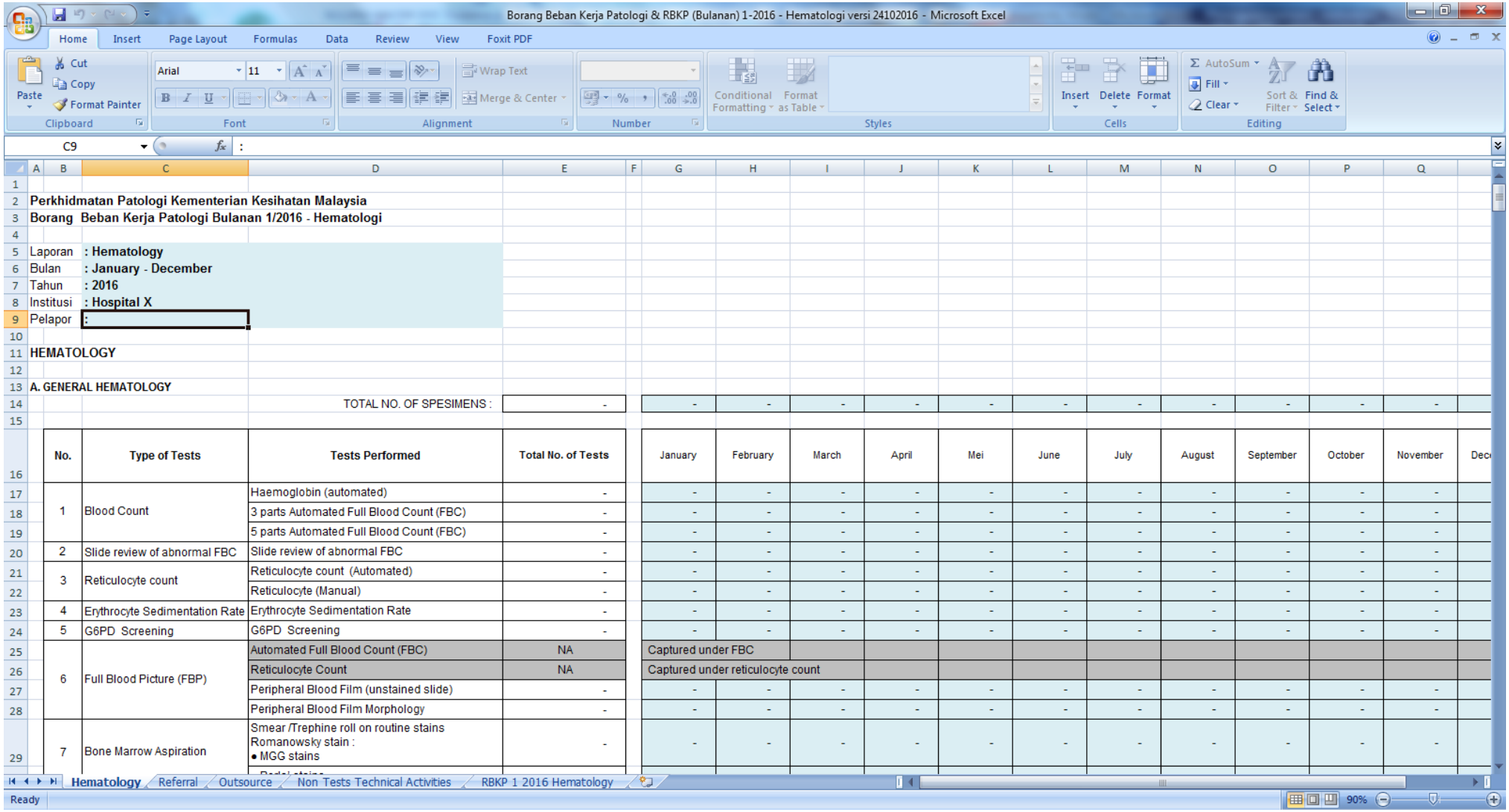
REPORT ON LABORATORY WORKLOAD: HAEMATOLOGY

FOR THE OF MONTH: _____ YEAR : _____

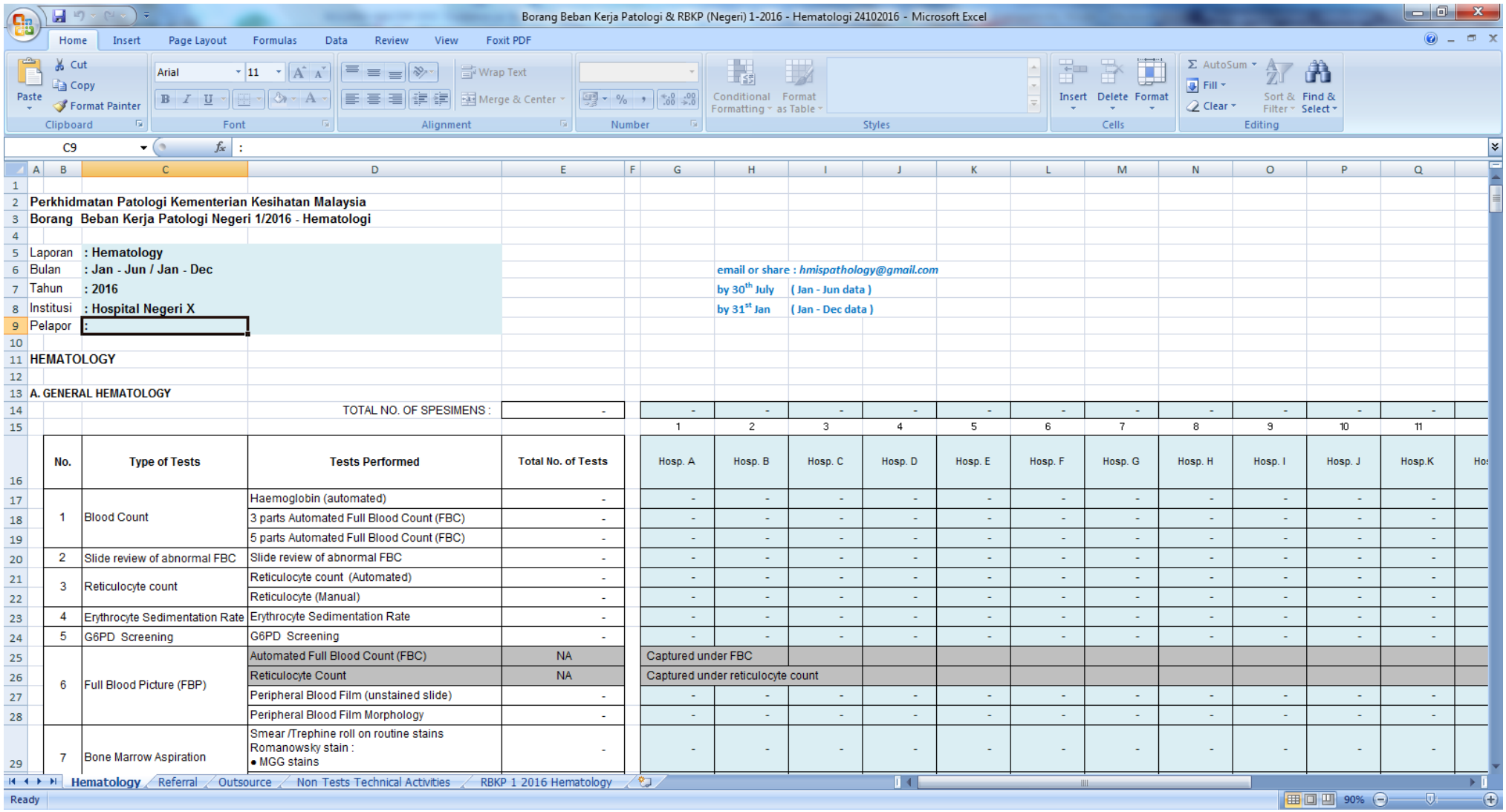
Month or Location of Hospitals, Institutions and Public Health Facilities	General Haematology		Haemostasis & Thrombosis				Red Cell Disorder		Haemoglobin Disorder		Immuno phenotyping		Molecular Diagnosis				Genetics for Heamatological disorder		Stem Cell Transplantation		Total No. of Specimens	Total No. of Tests
			Basic		Specialised								Non Malignant Haematology		Malignant Haematology							
	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T		

S=Number of Spesimen T=Number of Tests

Borang Beban Kerja Patologi Bulanan 1/2016 - Hematologi ('Excel Soft Copy')



Borang Beban Kerja Patologi Negeri 1/2016 - Hematologi ('Excel Soft Copy')



Borang Beban Kerja Patologi & RBKP (Negeri) 1-2016 - Hematologi 24102016 - Microsoft Excel

Perkhidmatan Patologi Kementerian Kesihatan Malaysia

Borang Beban Kerja Patologi Negeri 1/2016 - Hematologi

Laporan : **Hematology**
Bulan : **Jan - Jun / Jan - Dec**
Tahun : **2016**
Institusi : **Hospital Negeri X**
Pelapor :

email or share : *hmispathology@gmail.com*
by 30th July (Jan - Jun data)
by 31st Jan (Jan - Dec data)

HEMATOLOGY

A. GENERAL HEMATOLOGY

TOTAL NO. OF SPESIMENS : -

	No.	Type of Tests	Tests Performed	Total No. of Tests	Hosp. A	Hosp. B	Hosp. C	Hosp. D	Hosp. E	Hosp. F	Hosp. G	Hosp. H	Hosp. I	Hosp. J	Hosp.K
					1	2	3	4	5	6	7	8	9	10	11
17	1	Blood Count	Haemoglobin (automated)	-	-	-	-	-	-	-	-	-	-	-	-
18			3 parts Automated Full Blood Count (FBC)	-	-	-	-	-	-	-	-	-	-	-	-
19			5 parts Automated Full Blood Count (FBC)	-	-	-	-	-	-	-	-	-	-	-	-
20	2	Slide review of abnormal FBC	Slide review of abnormal FBC	-	-	-	-	-	-	-	-	-	-	-	-
21	3	Reticulocyte count	Reticulocyte count (Automated)	-	-	-	-	-	-	-	-	-	-	-	-
22			Reticulocyte (Manual)	-	-	-	-	-	-	-	-	-	-	-	-
23	4	Erythrocyte Sedimentation Rate	Erythrocyte Sedimentation Rate	-	-	-	-	-	-	-	-	-	-	-	-
24	5	G6PD Screening	G6PD Screening	-	-	-	-	-	-	-	-	-	-	-	-
25	6	Full Blood Picture (FBP)	Automated Full Blood Count (FBC)	NA	Captured under FBC										
26			Reticulocyte Count	NA	Captured under reticulocyte count										
27			Peripheral Blood Film (unstained slide)	-	-	-	-	-	-	-	-	-	-	-	-
28			Peripheral Blood Film Morphology	-	-	-	-	-	-	-	-	-	-	-	-
29	7	Bone Marrow Aspiration	Smear /Trephine roll on routine stains Romanowsky stain : • MGG stains	-	-	-	-	-	-	-	-	-	-	-	-

Hematology | Referral | Outsource | Non Tests Technical Activities | RBKP 1 2016 Hematology

Ready

7.4 MEDICAL MICROBIOLOGY

7.4.1 In addition to workload reporting to MOH using PER-SS 206 (Pin. 1/2000) form, hospital laboratories are also to submit to their respective State Pathologists, in soft copy, detailed (granular), as well as, summarised workload data on Medical Microbiology, using *Borang Beban Kerja Patologi Bulanan 1/2016 - Mikrobiologi Perubatan* and *Borang Ringkasan Beban Kerja Patologi 1/2016 - Mikrobiologi Perubatan*, respectively.

7.4.2 The total number of specimens received by a laboratory is calculated from total number of specimens received across the designated groups (bacteriology, mycology, parasitology, immunology and virology).

7.4.3 Culture is divided into primary culture (culture from original sample including blood culture bottle) and secondary culture (second culture done from primary culture/broth e.g. culture from positive bottle; culture done from Selenite F). Myco/F lytic bottle is included in the blood culture in bacteriology section. The number of culture is counted as one regardless of the number of media plates used.

7.4.4 Biochemical identification is divided into preliminary and definitive identification and also according to test methods e.g manual (M), commercial kit (C) or automation (A). Example of preliminary biochemical testing is screening of stool pathogens e.g Enteropathogenic E coli (EPEC), Salmonella and Shigella. The number of test for biochemical identification is counted as one test for one set of biochemical identification done per organism, regardless of the number of biochemicals and methodology used.

7.4.5 Serotyping includes Lancefield grouping and serotyping for organisms such as *Salmonella*, *Shigella*, *Vibrio*, EPEC, *Haemophilus* etc. For hospitals, the number of test will be counted as one test for each organism and will be included in the culture workload. For referral laboratories e.g IMR and MKAK which performed surveillance and outbreak investigations, the number of test will be the number of actual serotyping done.

7.4.6 Antimicrobial sensitivity testing are divided into manual (disk diffusion, which may be further divided into preliminary and definitive), automated (e.g Vitek) or on a single plate e.g yeast broth sensititer. Each test is counted as one regardless of the number of plates or strips used. For institution which practices preliminary antimicrobial testing from blood culture bottle, the procedure is counted as one test.

7.4.7 Detection of multidrug resistance e.g ESBL confirmation test, modified Hodge test is counted under culture and sensitivity for hospitals as the test is done on the same specimen for culture.

7.4.8 Each profile testing in serology/immunology using a multitest kit is counted as one test e.g. several antibodies/antigens are detected on a single slide, cartridge or plate. If an individual test kit is used for that profile, the number of test is counted as one for each test. For antibody testing, the number of tests for different class of antibody are counted separately.

7.4.9 Any subsequent dilution performed following a screening test e.g. ANA and RPR, is counted as one additional test, regardless of the number of serial dilutions performed.

7.4.10 For molecular testing, the test is classified according to method of testing i.e. manual, semi automation or full automation. Regardless of the method of testing, the workload calculation is based on every gene tested i.e. each gene tested is considered as one test.

7.4.11 There are several tests generally performed under the umbrella of Chemical Pathology that are also run in Medical Microbiology / Serology / Immunology laboratories. These tests include urine biochemistry (striptest/dipstick-Qualitative), urine pregnancy test, urine microscopy (manual or automated), CRP, C3, C4, IgG, IgA and IgM and total IgE. The workload for these tests are captured depending on the local practices and the discipline performing the tests. The final workload however, is encouraged to be reported under Chemical Pathology. In T & B Lymphocyte Subset Enumeration (Dual platform method) test, FBC is to be reported under haematology and for seminal fluid analysis, the number of tests will be reported under cytology.

7.4.12 Preanalytical workload (for 'non test technical activities') such as media preparation, as well as slide preparation for TB EQA and Indirect Immunoperoxidase (IIP) test is captured mainly for the purpose of manpower requirement. It is however, not counted in the total number of tests performed.

7.4.13 Any test offered that is not in the list, requires the workload submission to be temporarily added under 'others' and according to designated groups. Please inform National Pathology Workload Committee via Head of Discipline, of the test names that are to be added into the test list in both *Borang Beban Kerja Patologi Bulanan 1/2016 - Mikrobiologi* and *Borang Beban Kerja Patologi Negeri 1/2016 - Mikrobiologi.*

7.4.14 Workload calculation and recording:

A. BACTERIOLOGY

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
A1	Microscopy	*No. of specimens received for each test*	Wet mount	*x 1*
			Gram stain	*x 1*
			Indian ink	*x 1*
A2	Cell count		Cell count	*x 1*
A3	Bacterial antigen detection		Bacterial antigen test	*x 1*
A4	Culture (all types of specimen)	*No. of specimens received*	Primary culture	*x 1*
			Secondary culture	*x 1*
	Biochemical Identification		Preliminary biochemical identification	*x 1*
			Biochemical identification (Manual)	*x 1*
			Biochemical identification (Commercial e.g API)	*x 1*
			Biochemical identification (Automation e.g Vitek)	*x 1*

	Serotyping		Serotyping	*x 1*
	Antibiotic sensitivity testing	*No. of specimens received*	Preliminary Antibiotic Sensitivity testing (Disk diffusion)	*x 1*
			Antibiotic Sensitivity Testing (Disk diffusion)	*x 1*
			Antibiotic Sensitivity Testing (E test)	*x 1*
			Antibiotic sensitivity testing (Automation e.g Vitek)	*x 1*
	Detection of resistance		AmpC	*x 1*
			B- lactamase	*x 1*
			ESBL	*x 1*
			Modified Hodge test	*x 1*
			MRSA MecA	*x 1*
A5	TB (all types of specimens)	*No. of specimens received*	Direct smear (Ziehl Neelsen)	*x 1*
			Direct smear (IF)	*x 1*
		No. of specimens received	Conventional culture	*x 1*
			Automated culture	*x 1*
		No. of specimens received	MTB - conventional PCR	*x 1*
			MTB - fully automated PCR	*x 1*
		No. of specimens received	MDRTB LPA	*x 1*
			MDRTB GeneXpert	*x 1*
		No. of specimens received	Antibiotic sensitiity testing - first line	*x 1*
			Antibiotic sensitiity testing - second line	*x 1*
A6	*Mycobacterium leprae*	*No. of specimens received for each tests*	Slit skin smear	*x 1*
			Culture	*x 1*
			Conventional PCR	*x 1*
			Fully automated PCR	*x 1*
			AST	*x 1*
A7	Detection of multidrug resistance organisms/resistance gene (for referral laboratories)	*No. of specimens received for each tests*	AmpC	*x 1*
			B lactamase	*x 1*
			ESBL	*x 1*
			Modified Hodge test	*x 1*
			CaMRSA - MecA gene,	*x 1*
			CaMRSA - PVL gene	*x 1*
			KPC	*x 1*
			OXA	*x 1*
			VIM	*x 1*
			IMP	*x 1*
A8	Serotyping (for referral laboratories)	*No. of specimens received for each organism*	*Haemophilus influenzae* serotyping	*x actual number of serotyping performed for each organism*
			E coli serotyping serotyping	
			Salmonella serotyping	
			Shigella serotyping	
			Vibrio cholerae serotyping	
			Strep pneumoniae serotyping	
			Neisseria meningitidis serotyping	
A9	**Serology**			
1	Anti- Streptolysin O titre (ASOT)	*No. of specimens received for each test*	Anti- Streptolysin O titre	*x 1*
2	*Bartonella henselae* Antibody		*Bartonella henselae* IgG	*x 1*
			Bartonella henselae IgM	*x 1*

3	*Borrelia burgdorferi* Antibody	*No. of specimens received for each test*	*Borrelia burgdorferi* IgG	*x 1*
			Borrelia burgdorferi IgM	*x 1*
4	*Brucella abortus* Antibody		*Brucella abortus* IgG	*x 1*
			Brucella abortus IgM	*x 1*
5	*Brucella melitensis* Antibody		*Brucella melitensis* IgG	*x 1*
			Brucella militensis IgM	*x 1*
6	*Chlamydia pneumoniae* Antibody		*Chlamydia pneumoniae* IgG	*x 1*
			Chlamydia pneumoniae IgM	*x 1*
7	*Chlamydia psittaci* Antibody		*Chlamydia psittaci* IgG	*x 1*
			Chlamydia psittaci IgM	*x 1*
8	*Chlamydia trachomatis* Antibody		*Chlamydia trachomatis* IgG	*x 1*
			Chlamydia trachomatis IgM	*x 1*
9	*Clostridium difficile* toxin assay		*Clostridium difficile* toxin assay	*x 1*
10	*Coxiella burnetii* Antibody		*Coxiella burnetii* IgG	*x 1*
			Coxiella burnetii Ig M	*x 1*
11	CSF VDRL	*No. of specimen received*	CSF VDRL screening	*x 1*
			CSF VDRL dilution	*x 1*
12	Rickettsial Antibody	*No. of specimens received for each test*	Indirect Immunoperoxidase (IIP) Rickettsial IgG	*x 1*
			Indirect Immunoperoxidase (IIP) Rickettsial IgM	*x 1*
13	*Legionella pneumophilia* serology	*No. of specimens received for each test*	*Legionella pneumophilia* Ag	*x 1*
			Legionella pneumophilia IgG	*x 1*
			Legionella pneumophilia IgM	*x 1*
14	Leptospira Antibody	*No. of specimens received for each test*	Leptospira IgM	*x 1*
			Leptospira IgG	*x 1*
			Lepto spira MAT	*x 1*
			Lepto spira MAT dilution	*x 1*
15	Melioidosis IgM	*No. of specimen received*	Melioidosis IgM	*x 1*
			Melioidosis IgM dilution	*x 1*
16	*Mycoplasma pneumoniae* Antibody	*No. of specimens received for each test*	*Mycoplasma pneumoniae* IgG	*x 1*
			Mycoplasma pneumoniae IgM	*x 1*
17	Atypical pneumonia screening (Pneumobact) IF		Atypical pneumonia screening (Pneumobact) IF	*x 1*
18	*Strep pneumoniae* urinary antigen		*Strep pneumoniae* urinary antigen	*x 1*
19	*Streptococcus,* Group B urinary antigen		*Streptococcus,* Group B urinary antigen	*x 1*
20	TPHA or TPPA		TPHA or TPPA	*x 1*
21	Typhoid Antibody		Typhidot IgG	*x 1*
			Typhidot IgM	*x 1*
22	RPR/VDRL Serum	*No. of specimens received*	RPR /VDRL screening	*x 1*
			RPR/VDRL dilution	*x 1*
A10	**Molecular**			
1	Bordetella pertussis	*No. of specimens received for each tests*	Bordetella pertussis	*x 1*
2	Brucella		Brucella	*x 1*
3	Identification of bacteria by 16sRNA	*No. of specimens received*	16s sequencing Forward sequencing	*x 1*
			16s sequencing Reverse sequencing	*x 1*
4	Leptospira PCR	*No. of specimens received*	Leptospira PCR	*x 1*

A11	**Sterility testing**			
1	Biological Indicator	*No. of specimens received*	Culture	*x 1*
2	Air Sampling	*No. of specimens received*	Culture	*x 1*
			Biochemical	*x 1*
3	In-use Testing	*No. of specimens received*	Culture	*x 1*
			Biochemical	*x 1*
4	Environment screen	*No. of specimens received*	Culture	*x 1*
			Biochemical	*x 1*
5	R.O water/ Endotoxin	*No. of specimens received*	Culture	*x 1*
			Biochemical	*x 1*
6	Sterility Testing	*No. of specimens received*	Culture	*x 1*
			Biochemical	*x 1*
A12	Others (if test not listed)	*No. of specimens received*	Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

B. MYCOLOGY

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
B1	Microscopy	*No. of specimens received*	Direct Microscopy (KOH)	*x 1*
			Indian ink	*x 1*
			LPCB stain	*x 1*
			Pneumocystis carinii IF	*x 1*
B2	Culture and sensitivity	*No. of specimens received*	Plate culture	*x 1*
			Slide culture	*x 1*
			Biochemical (M)	*x 1*
			Biochemical(C)	*x 1*
			Biochemical(A)	*x 1*
			Sensitivity testing E-test	*x 1*
			Sensitivity testing broth method	*x 1*
B3	**Serology**			
1	Aspergillus galactomannan Ag	*No. of specimens received for each test*	Aspergillus Galactomannan Ag	*x 1*
2	Candida mannan Ag		Candida Mannan Ag	*x 1*
3	Cryptococcal Ag (serum/CSF)	*No. of specimens received*	Cryptococcal Ag (serum/CSF)	*x 1*
			Cryptococcal Ag (serum/CSF) dilution	*x 1*
4	Histoplasma IgM	*No. of specimens received*	Histoplasma IgM	*x 1*
B4	**PCR**			
1	Fungal PCR	*No. of specimens received*	Manual PCR	*x 1*
			Semi-automated PCR	*x 1*
			Fully automated PCR	*x 1*
2	16s sequencing	*No. of specimens received*	16s sequencing Forward sequencing	*x 1*
			16s sequencing Reverse sequencing	*x 1*
B5	Others (if test not listed)	*No. of specimens received*	Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

C. PARASITOLOGY

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
1	Acanthamoeba/Naegleria	*No. of specimens received*	Microscopy	*x 1*
			Culture	*x 1*
			Multiplex PCR	*x 1*
2	Amoebiasis	*No. of specimens received*	Microscopy	*x 1*
			Serology	*x 1*
			PCR	*x 1*
3	Cryptosporidium spp	*No. of specimens received for each test*	Modified DMSO stain	*x 1*
4	Cysticercosis		ELISA	*x 1*
5	Filariasis	*No. of specimens received*	Giemsa stain	*x 1*
			PanLF assay	*x 1*
			ICT Bancroftian assay	*x 1*
			Manual/Semi automated PCR	*x 1*
6	Giardia lamblia	*No. of specimens received*	Microscopy	*x 1*
			Culture	*x 1*
7	Helminth diagnosis	*No. of specimen received*	Macroscopy	*x 1*
			Culture	*x 1*
8	Hydatid disease	*No. of specimens received*	ELISA	*x 1*
9	Leishmaniasis	*No. of specimens received*	Giemsa stain	*x 1*
			ELISA	*x 1*
			PCR	*x 1*
10	Malaria	*No. of specimens received*	Giemsa stain	*x 1*
			Rapid test	*x 1*
			IF Antibody test	*x 1*
			Seminested PCR	*x 1*
11	Microsporodium spp	*No. of specimens received for each test*	Gram chromotrope stain	*x 1*
12	Schistosomiasis		ELISA	*x 1*
13	Stool Ova & Cyst	*No. of specimens received*	Direct smear	*x 1*
			Fecal concentration	*x 1*
			Trichrome stain	*x 1*
14	Toxocariasis	*No. of specimens received*	ELISA	*x 1*
15	Toxoplasma	*No. of specimens received*	ELSA IgM	*x 1*
			ELISA IgG	*x 1*
			IFAT - Ig G	*x 1*
			IFAT - Ig M	*x 1*
			IgG avidity	*x 1*
			IgA	*x 1*
16	Trichinellosis	*No. of specimens received*	ELISA	*x 1*
17	Trypanosomiasis	*No. of specimens received*	Giemsa stain	*x 1*
			Manual/Semi automation PCR	*x 1*
18	Others (if test not listed)	*No. of specimens received*	Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

D. IMMUNOLOGY

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
1	Acetylcholine-receptor Antibody	*No. of specimens received*	Acetylcholine-receptor Antibody	*x 1*
2	ANA	*No. of specimens received for each test*	ANA Colorzyme	*x 1*
			ANA ELISA	*x 1*
			ANA IF	*x 1*
			ANA dilution	*x 1*
3	ANCA	*No. of specimens received for each test*	ANCA ethanol IF	*x 1*
			ANCA formalin IF	*x 1*
			ANCA dot	*x 1*
			Myeloperoxidase ANCA	*x 1*
			PR3 ANCA	*x 1*
4	Anti-Aquaporin 4 (Anti-Aq4)		Anti-Aquaporin 4 (Anti-Aq4)	*x 1*
5	Anti-Beta 2 glycoprotein 1 Antibody		Anti-Beta 2 glycoprotein 1 IgG	*x 1*
			Anti- Beta 2 glycoprotein 1 IgM	*x 1*
6	Anti- cardiolipin Antibody		Anti- cardiolipin IgM	*x 1*
			Anti- cardiolipin IgG	*x 1*
7	Anti-Cyclic Citrullinated Protein (CCP/ACPA)		Anti-Cyclic Citrullinated Protein (CCP/ACPA)	*x 1*
8	Anti-Deamidated-Gliadin Antibody		Anti-Deamidated-Gliadin IgA	*x 1*
			Anti-Deamidated-Gliadin IgG	*x 1*
9	Anti-desmoglein 1, Anti-desmoglein 3		Anti-desmoglein 1, Anti-desmoglein 3	*x 1*
10	Anti-dsDNA		Anti - dsDNA EIA	*x 1*
			Anti - dsDNA IF	*x 1*
			Anti - dsDNA Colorzyme	*x 1*
11	Anti- gastric parietal cell		Anti- gastric parietal cell	*x 1*
12	Anti-Glomerular Basement Membrane (GBM)		Anti-Glomerular Basement Membrane (GBM)	*x 1*
13	Anti-Liver-Kidney Microsomal (LKM)	*No. of specimens received for each test*	Anti-Liver-Kidney Microsomal (LKM)	*x 1*
14	Anti-Mitochondrial Antibody (AMA)		Anti-Mitochondrial Antibody (AMA)	*x 1*
15	Anti-N-Methyl-D-Aspartate Receptor (NMDAR)		Anti-N-Methyl-D-Aspartate Receptor	*x 1*
16	Anti- Smooth Muscle Antibody (ASMA)		Anti- Smooth Muscle Antibody (ASMA)	*x 1*
17	Coeliac Antibodies		Anti-Tissue Transglutaminase (tTG) IgA	*x 1*
			Anti-Tissue Transglutaminase (tTG) IgG	*x 1*
			Anti-endomysium Ig A	*x 1*
			Anti-endomysium IgG	*x 1*
			Anti-gliadin IgA	*x 1*
			Anti-gliadin IgG	*x 1*
18	Dihydrorhodamine assay (DHR)		Dihydrorhodamine assay (DHR)	*x 1*
19	Eosinophilic Cationic Protein		Eosinophilic Cationic Protein	*x 1*
20	Extractable Nuclear Antigen (ENA) screening	*No. of specimens received*	Extractable Nuclear Antigen (ENA) screening	*x 1*
21	Extractable Nuclear Antigen (ENA) confirmation	*No. of specimens received*	Specific ENA antibodies	*x no. of specific ENA tested*
22	Gamma-aminobutyric acid-b Receptor (GABA) Antibody	*No. of specimens received*	Gamma-aminobutyric acid-b Receptor (GABA) Antibody	*x 1*

23	Gangliosides Antibodies	*No. of specimens received*	Anti-GM1, Anti-GM2, Anti-GM3, Anti-GD1a, Anti-GD1b, Anti-GT1b, Anti-GQ1b IgG	*x 1*
			Anti-GM1, Anti-GM2, Anti-GM3, Anti-GD1a, Anti-GD1b, Anti-GT1b, Anti-GQ1b IgM	*x 1*
24	Human leukocyte antigens (HLA) Antibody Detection (Donor Specific Antibody)	*No. of specimens received for each test*	Human leukocyte antigens (HLA) Antibody Detection (Donor Specific Antibody)	*x 1*
25	Human leukocyte antigens (HLA) Crossmatch (Complement Dependent Cytotoxicity)		Human leukocyte antigens (HLA) Crossmatch (Complement Dependent Cytotoxicity)	*x 1*
26	Human leukocyte antigens (HLA) Crossmatch (Flow Cytometry)		Human leukocyte antigens (HLA) Crossmatch (Flow Cytometry)	*x 1*
27	Human leukocyte antigens (HLA) Typing Class I (Loci A, B and C)	*No. of specimens received for each test*	Low / medium resolution (SSP/SSO)	*x 1*
			High resolution	*x molecular markers tested*
28	Human leukocyte antigens (HLA) Typing Class I and II (Loci A, B and DR)		Low / medium resolution (SSP/SSO)	*x 1*
			High resolution	*x molecular markers tested*
29	Human leukocyte antigens (HLA) Typing Class II (Loci DR and DQ)		Low / medium resolution (SSP/SSO)	*x 1*
			High resolution	*x molecular markers tested*
30	Human leukocyte antigens (HLA) Typing for Disease Association		Human leukocyte antigens (HLA) Typing for Disease Association	*x 1*
31	IgE specific allergen	*No. of specimens received*	IgE specific allergen	*x no of allergen tested*
32	Leukocytes Adhesion Deficiency Type 1	*No. of specimens received*	Leukocytes Adhesion Deficiency Type 1	*x 1*
33	Liver autoantibodies - screening	*No. of specimens received*	Liver autoantibodies screening	*x 1*
34	Liver autoantibodies - Specific	*No. of specimens received*	Specific liver antibody	*x specific liver antibodies tested*
35	Lymphocytes proliferation test	*No. of specimens received for each test*	Lymphocytes proliferation test	*x 1*
36	Phagocytic function test		Phagocytic function test	*x 1*
37	PNS Antibodies		PNS Antibodies - Anti-Hu, Anti-Ri, Anti-Ma, Anti-Yo, Amphiphysin, CV2	*x 1*
38	Rheumatoid factor (RF)		RF isotype ie. IgM/IgG/IgA	*x no. of isotype tested*
39	Skin Antibodies - Anti BP 180, Anti BP 230		Skin Antibodies - Anti BP 180, Anti BP 230	*x 1*
40	Tryptase		Tryptase	*x 1*
41	T & B Lymphocyte Subset Enumeration (Dual platform method)		CD3/4/8/45/19/56/16	*x MoAb used*
42	Others (if test not listed)	*No. of specimens received*	Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

E. VIROLOGY

No.	Type of Tests	No. Specimens	Tests Performed	No. Test performed
E1	Electron microscopy	*No. of specimens received*	Electron microscopy	*x 1*
E2	**Antigen detection**			
1	Rotavirus	*No. of specimens received for each tests*	Rotavirus	*x 1*
2	Norovirus		Norovirus	*x 1*
3	Adenovirus		Adenovirus	*x 1*
4	Rabies virus		Rabies virus Ag IFAT	*x 1*
E3	**SEROLOGY**			
1	Chikungunya Antibody	*No. of specimens received for each test*	Chikungunya IgM	*x 1*
			Chikungunya IgG	*x 1*
2	CMV Antibody		CMV IgM	*x 1*
			CMV IgG	*x 1*
3	Coxsackie virus		Coxsackie virus	*x 1*
4	Dengue Antigen/Antibody		Dengue Combo – NS1, IgM/IgG	*x 1*
			Dengue IgG	*x 1*
			Dengue IgM	*x 1*
			Dengue NS I Antigen	*x 1*
5	EBV Antibody		EBV IgG	*x 1*
			EBV IgM	*x 1*
6	Enteroviruses Antigen		Enteroviruses Ag	*x 1*
7	Hantavirus Antibody		Hantavirus Antibody PA	*x 1*
			Hantavirus IgG	*x 1*
			Hantavirus IgM	*x 1*
8	HAV Antibody		HAVAb Total	*x 1*
			HAV IgM	*x 1*
9	HBc Antibody		HBc IgM	*x 1*
			HBc Total Antibody	*x 1*
10	HBe Antibody		Hbe Antibody	*x 1*
11	HBe Antigen		Hbe Antigen	*x 1*
12	HBsAg		HBsAg	*x 1*
13	HBsAg Confirmatory		HBsAg Confirmatory	*x 1*
14	HBsAb		HBs Ab	*x 1*
15	HCV Ab		HCV Ab	*x 1*
16	HCV Confirmatory		HCV Confirmatory (LIA)	*x 1*
17	HCV Supplementary (PA)		HCV Supplementary (PA)	*x 1*
18	HDV Antibody		HDV IgM	*x 1*
			HDV IgG	*x 1*
19	HEV Antibody		HEV IgM	*x 1*
			HEV IgG	*x 1*
20	HHV6 Antibody		HHV6 IgM	*x 1*
			HHV6 IgG	*x 1*
21	HIV Antibody		HIV Ab ELISA	*x 1*
			HIV Ab PA	*x 1*
			HIV Ab western blot/LIA	*x 1*
22	HIV Ag		HIV Ag	*x 1*
23	HIV Ag/Ab		HIV Ag/Ab	*x 1*
24	HSV Antibody		HSV IgM	*x 1*
			HSV IgG	*x 1*

25	HTVL Antibody	*No. of specimens received for each test*	HTVL Ab	*x 1*
26	Japanese encephalitis Antibody		Japanese encephalitis IgM	*x 1*
			Japanese encephalitis IgG	*x 1*
27	Measles Antibody		Measles IgM	*x 1*
			Measles IgG	*x 1*
28	Mumps Antibody		Mumps IgM	*x 1*
			Mumps IgG	*x 1*
29	Parvovirus B 19 Antibody		Parvovirus B 19 IgM	*x 1*
			Parvovirus B 19 IgG	*x 1*
30	Respiratory viruses screening		Respiratory viruses IFAT screening	*x 1*
31	Respiratory viruses identification	*No. of specimens received*	Respiratory viruses identification eg. - Influenza A - Influenza B - Parainfluenza 1 - Parainfluenza 2 - Parainfluenza 3 - Adenovirus - Respiratory syncitial virus - Metapneumovirus	*x no. of viral species tested*
32	Rubella Antibody	*No. of specimens received for each test*	Rubella IgM	*x 1*
			Rubella IgG	*x 1*
33	VZV Antibody		VZV IgM	*x 1*
			VZV IgG	*x 1*
E4	**MOLECULAR**			
1	BK virus PCR	*No. of specimens received for each test*	BK virus PCR genome detection and quantitation	*x 1*
2	Chikugunya virus		Chikugunya virus	*x 1*
3	CMV		CMV genome detection and quantitation	*x 1*
4	Coronavirus		Coronavirus	*x 1*
5	Coxsackie virus A16,A24		Coxsackie virus A16,A24	*x 1*
6	Coxsackie B		Coxsackie B	*x 1*
7	Crimerian Congo haemorrhagic fever		Crimerian Congo haemorrhagic fever	*x 1*
8	Dengue virus		Dengue virus genome detection	*x 1*
9	Dengue virus serotyping		Dengue virus serotyping	*x 1*
10	Ebola virus		Ebola virus	*x 1*
11	Enterovirus 71		Enterovirus 71	*x 1*
12	HAV		HAV	*x 1*
13	HBV quantitation		HBV quantitation	*x 1*
14	HCV quantitation		HCV quantitation	*x 1*
15	HCV genotyping		HCV genotyping	*x 1*
16	HIV - Drug resistant testing		HIV - Drug resistant testing	*x 1*
17	HIV genotyping Assay	*No. of specimens received*	HIV genotyping assay	*x 1*
			HIV genotyping assay sequencing	*x 1*
18	HIV RNA (Paediatric)	*No. of specimens received for each test*	HIV RNA	*x 1*
19	HIV Viral Load		HIV Viral Load	*x 1*
20	HSV 1/2		HSV 1/2	*x 1*
21	Identification by 16sRNA		Identification by 16sRNA	*x 1*
22	Japanese Encephalitis		Japanese Encephalitis	*x 1*
23	JC Virus PCR		JC Virus PCR genome detection and quantitation	*x 1*
24	Lassa Virus		Lassa Virus	*x 1*

25	Marburg	*No. of specimens received*	Marburg	*x 1*
26	Measles		Measles	*x 1*
27	Nipah virus		Nipah virus	*x 1*
28	PanEnterovirus		PanEnterovirus	*x 1*
29	Parvovirus		Parvovirus	*x 1*
30	Rabies		Rabies	*x 1*
31	Respiratory viruses		Respiratory viruses multiplex PCR	*x 1*
			FluA	*x 1*
			FluB	*x 1*
			H1N1	*x 1*
			MERS CoV	*x 1*
			SARS Coronavirus	*x 1*
			Specific Respiratory viruses other than listed above	*x no. viral species tested*
32	Rift valley nucleic acid	*No. of specimens received for each tests*	Rift valley fever	*x 1*
33	Rotavirus		Rotavirus	*x 1*
34	Rubella		Rubella	*x 1*
35	St Louis Encephalitis		St Louis Encephalitis	*x 1*
36	Varicella zoster Virus		Varicella zoster Virus	*x 1*
37	West Nile virus		West Nile virus	*x 1*
38	Yellow virus		Yellow virus	*x 1*
39	Zika virus		Zika virus	*x 1*
E5	**VIRAL ISOLATION**			
1	Chikungunya	*No. of specimens received for each test*	Chikungunya	*x 1*
2	CMV		CMV	*x 1*
3	Coronavirus		Coronavirus	*x 1*
4	Coxsackie virus		Coxsackie virus	*x 1*
5	Dengue virus		Dengue virus	*x 1*
6	Enteroviruses		Enteroviruses	*x 1*
7	Herpes Simplex Virus (HSV)		Herpes Simplex Virus (HSV)	*x 1*
8	Japanese Encephalitis		Japanese Encephalitis	*x 1*
9	Measles		Measles	*x 1*
10	Mumps		Mumps	*x 1*
11	Non-Poliovirus Virus		Non-Poliovirus Virus	*x 1*
12	Paramyxovirus		Paramyxovirus	*x 1*
13	Poliovirus Virus		Poliovirus Viral isolation	*x 1*
14	Poliovirus Environmental Surveillance		Poliovirus Environmental Surveillance	*x 1*
15	Rabies		Rabies	*x 1*
16	Rubella		Rubella	*x 1*
17	SARS Coronavirus		SARS Coronavirus	*x 1*
18	Respiratory viruses	*No. of specimens received*	Respiratory viruses eg. - Influenza A - Influenza B - Parainfluenza 1 - Parainfluenza 2 - Parainfluenza 3 - Adenovirus - Respiratory syncitial virus - Metapneumovirus	*x no. viral species tested*
E6	Others (if test not listed)	*No. of specimens received*	Each indivdual test	*x 1*
	TOTAL		**TOTAL**	

PREANALYTICAL WORKLOAD (FOR 'NON-TEST' TECHNICAL ACTIVITIES)

Activity	Workload
Media preparation	Volume in litres
TB EQA slides	Number of slides
IIP slides	Number of slides

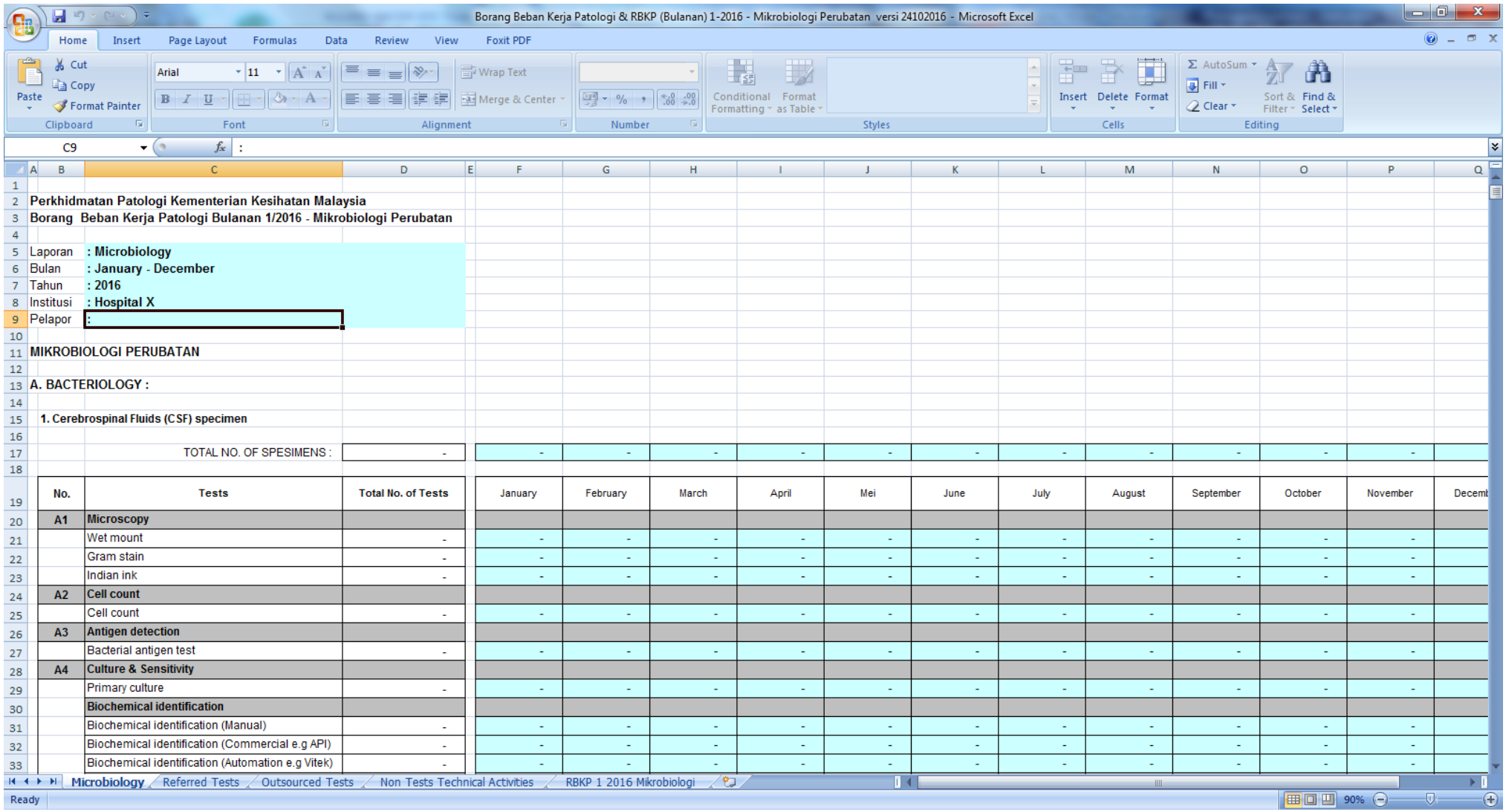
PATHOLOGY SERVICES
MINISTRY OF HEALTH, MALAYSIA

REPORT ON LABORATORY WORKLOAD: MEDICAL MICROBIOLOGY

FOR THE OF MONTH: _____ YEAR : _____

Month or Location of Hospitals, Institutions and Public Health Facilities	Bacteriology		Mycology		Parasitology		Immunology		Virology		Total No. of Specimens	Total No. of Tests
	No. of specimens	No. of tests	No. of specimens	No. of tests	No. of specimens	No. of tests	No. of specimens	No. of tests	No. of specimens	No. of tests		

Borang Beban Kerja Patologi Bulanan 1/2016 – Mikrobiologi Perubatan ('Excel Soft Copy')



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Perkhidmatan Patologi Kementerian Kesihatan Malaysia

Borang Beban Kerja Patologi Bulanan 1/2016 - Mikrobiologi Perubatan

Laporan : Microbiology
Bulan : January - December
Tahun : 2016
Institusi : Hospital X
Pelapor :

MIKROBIOLOGI PERUBATAN

A. BACTERIOLOGY :

1. Cerebrospinal Fluids (CSF) specimen

No.	Tests	Total No. of Tests	January	February	March	April	Mei	June	July	August	September	October	November	Decemt
	TOTAL NO. OF SPESIMENS :	-	-	-	-	-	-	-	-	-	-	-	-	
A1	Microscopy													
	Wet mount	-	-	-	-	-	-	-	-	-	-	-	-	
	Gram stain	-	-	-	-	-	-	-	-	-	-	-	-	
	Indian ink	-	-	-	-	-	-	-	-	-	-	-	-	
A2	Cell count													
	Cell count	-	-	-	-	-	-	-	-	-	-	-	-	
A3	Antigen detection													
	Bacterial antigen test	-	-	-	-	-	-	-	-	-	-	-	-	
A4	Culture & Sensitivity													
	Primary culture	-	-	-	-	-	-	-	-	-	-	-	-	
	Biochemical identification													
	Biochemical identification (Manual)	-	-	-	-	-	-	-	-	-	-	-	-	
	Biochemical identification (Commercial e.g API)	-	-	-	-	-	-	-	-	-	-	-	-	
	Biochemical identification (Automation e.g Vitek)	-	-	-	-	-	-	-	-	-	-	-	-	

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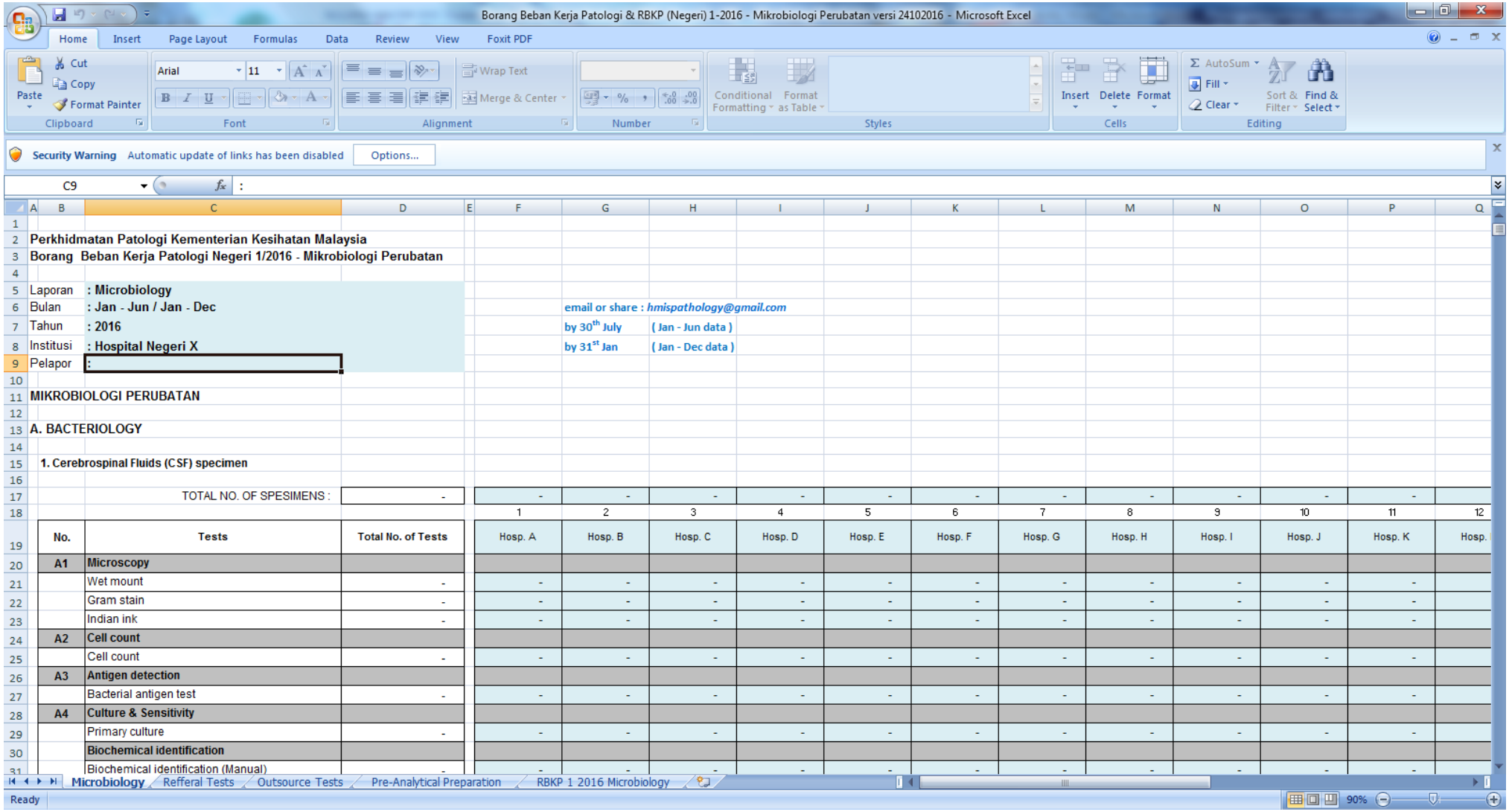

7.5 GENETICS FOR CONGENITAL ANOMALY AND CANCER

7.5.1 Genetic testing for congenital anomalies and cancers are done in either dedicated/stand-alone molecular genetic laboratories or as part of pathology discipline, such as anatomic pathology. Therefore, workload is captured depending on where the tests are being performed.

7.5.2 Workload calculation and recording:

No.	Type of Tests		No. Specimens	Tests Performed	No. Test performed
1	Conventional karyotype		*No. of specimens received*	Chromosome Analysis	*x 1*
2	FISH Test				
	Syndrome	**FISH Probes**	*No. of specimens received*	Fluorescence-in-situ hybridization (FISH)	*x 1*
2.1	Prader Willi / Angelman Syndrome	SNRPN (15q11.2)			*x 1*
2.2	William Syndrome	Elastin(7q11.23)			*x 1*
2.3	DiGeorge Syndrome	N25(22q11.2)			*x 1*
2.4	Smith Magenis Syndrome	SMCR(11p11.2)			*x 1*
2.5	Miller Dieker Syndrome	MDS(11p13.3)			*x 1*
2.6	Wolf-Hirschhorn Syndrome	WHSCR(4p16.3)			*x 1*
2.7	Cri Du Chat Syndrome	5p15			*x 1*
2.8	Rubenstein Taybi	16p13.3			*x 1*
		SRY / CEP X			*x 1*
		XpYp			*x 1*
		WCP 1-22, X. Y			*x 1*
		p,q telomeric probe			*x 1*
		Centromeric probe			*x 1*
3	Karyolite Bobs Assay - Congenital anomalies (9 microdeletion & all chromosome subtelomeric)		*No. of specimens received*	BACs on beads technique	*x 1*
4	Duchenne Muscular Dystrophy / Becker Muscular Dystrophy			MLPA	*x 1*
5	Muenke Syndrome			PCR - RFLP & Sequencing	*x 1*
6	Rett Syndrome			DHPLC, MLPA & Sequencing	*x 1*
7	Array Comparative Genomic Hybridization (Oligo) - Congenital anomalies - Cancer genetics			Microarray analysis	*x 1*
8	Cancer Genetics : EGFR, BRAF, KRAS			Real time PCR	*x 1*
9	Cancer Genetics FISH test : ALK , ROS 1, N-MYC			FISH	*x 1*
10	Others (if test not listed)		*No. of specimens received*	Each indivdual test	*x 1*
	TOTAL			**TOTAL**	

8. CONCLUSION AND ACKNOWLEDGEMENT

It is hope that this guideline will help in the collection of standardized and meaningful national pathology data, thus aiding future planning, as well as, enhancing the cost effectiveness of services provided by the Ministry of Health laboratories.

The committee would like to thank all those who had contributed or involved in giving various input, directly or indirectly, towards the preparation of this guideline.

9. WORKING COMMITTEE AND CONTRIBUTORS

COMMITTEE

1.	Dr. Muhammad Arif Mohd Hashim	- Advisor (Nat. Head of Pathology Services, 2014-Feb 2016)
2.	Dr. Arni Talib	- Advisor (Nat. Head of Pathology Services)
3.	Datin Dr. Nik Raihan Nik Mustapha	- Coordinator & Anatomic Patholoigst
4.	Dr. Mukarramah Che Ayub	- Anatomic Pathologist & Head of Discipline
5.	Dr. Hakimah Mahsin	- Anatomic Pathologist
6.	Dr. Noor Laili Mohd Mokhtar	- Anatomic Pathologist
7.	Dr. Baizurah Mohd Hussain	- Chemical Pathologist & Head of Discipline
8.	Dr. Mohd Jamsani Mat Salleh	- Chemical Pathologist
9.	Dr. Julaina Abd. Jalil	- Chemical Pathologist
10.	Dr. Nik Rus Mazeni Nik Yusoff	- Haematologist & Head of Discipline
11.	Dr. Ezalia Esa	- Haematologist & IMR Representative
12.	Dr. Siti Zaharah Idris	- Haematologist
13.	Cik Faridah Afandi	- Science Officer (Biochemist) & PDN Representative
14.	Datin Dr. Salbiah Hj. Nawi	- Clinical Microbiologist & Head of Discipline
15.	Dr. Noraini Ismail	- Clinical Microbiologist
16.	Dr. Rohani Md Yassin	- Clinical Microbiologist & IMR Representative
17.	En. Mohd Sadek Yasin	- Senior Science Officer (Microbiologist)
18.	Dr. Nor Zahrin Hasnan	- Clinical Epidemiologist & MKAK Representative
19.	Dr. Esah Md Ali	- Senior Medical Officer & MKAK Representative
20.	Dr. Santhi Armugam	- Science Officer (Biochemist) & BPKK Representative
21.	En. Azhari Hj. Sayuti	- Senior Science Officer (Biochemist)
22.	Hj. Mohd Sharani Abdul Rahman	- Senior Medical Laboratory Technologist
23.	Pn. Vuctoria Ponnusamy	- Senior Medical Laboratory Technologist & BPKK Representative.

CONTRIBUTORS

Anatomic Pathology:
1. Datin Dr. Fauziah bt. Kassim

Chemical Pathology:
1. Dr. Zabedah bt. Md Yunus
2. Dr. Siti Sharina bt. Anas
3. Dr. Nor'ashikin bt. Othman
4. Y/M Dr. Raja Elina bt. Raja Aziddin
5. Dr. Abdul Murad bin Mohd Nor
6. Pn. Yusnita bt. Yakob

Haematology:
1. Dr. Mimi Azura bt. Abd. Aziz
2. Dr. Siti Shahrum bt. Muhamed Said
3. Dr. Wan Hayati bt. Mohd Yaakob
4. Dr. Afifah bt. Hassan
5. Dr. Tun Maizura bt. Mohd Fathullah
6. Dr. Suzana bt. Zainol
7. Dr. Azura bt. Abdul Hamid
8. Dr. Noria bt. Abdul Mutalib

Medical Microbiology:
1. Dr. Masita bt. Arip
2. Dr. Suhaila bt. Md Hanapiah
3. Pn. Ng Pey Peng
4. Cik Keah Kwee Chu

Others:
1. Tn. Hj. Jaafar bin Md Shariff, Medical Assistant, BPKK.

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