

# Work Observation Method By Activity Timing (WOMBAT)

WHAT YOU NEED TO KNOW



# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

## TABLE OF CONTENTS

About WOMBAT.....	4
Why was WOMBAT developed? .....	5
The history of WOMBAT.....	5
How does WOMBAT work? .....	7
Licensing WOMBAT.....	7
Training.....	8
Is WOMBAT the right tool for me? .....	9
Data security .....	10
What do I need to consider before starting a WOMBAT study? .....	13
Frequently asked questions (FAQs) .....	15
Q: What is WOMBAT? .....	15
Q: Where can I access the WOMBAT app?.....	15
Q: Can I use the WOMBAT app without purchasing a WOMBAT licence? .....	15
Q: How much does a WOMBAT licence cost? .....	15
Q: Is the licence agreement for a single user, a group of researchers, or an institution? .....	16
Q: Once I purchase a WOMBAT licence, how many team members can use it?.....	16
Q: What does a WOMBAT licence include? .....	16
Q: Is WOMBAT training available? .....	16
Q: How do I purchase WOMBAT? .....	16
Q: What languages does WOMBAT support? .....	16
Q: What devices will WOMBAT work on and what are the system requirements? .....	16
Q: Will WOMBAT work on Android devices? .....	16
Q: How secure is WOMBAT? .....	16
Q: Who do I contact for more information or if I have further questions? .....	17
Q: Are there any publications where researchers have reported using WOMBAT? .....	17
FAQs for current WOMBAT users .....	17
Q: I need help using WOMBAT!.....	17
Q: How do I get updates on the WOMBAT software? .....	17
Q: How do I cite WOMBAT in my publication? .....	17
Q: Who do I contact for technical advice? .....	17
Q: When I try to download session data from the WOMBAT web app I receive an error:.....	17
Q: My WOMBAT licence is about to expire – what do I do? .....	18
Analysing WOMBAT data FAQs .....	18
Q: How do I analyse WOMBAT data?.....	18

# Work Observation Method By Activity Timing (WOMBAT)

What you need to know	July 2025
-----------------------	-----------

Q: How do I calculate IRR? .....	18
Q: Can I use hypothesis tests (e.g. t-tests) on WOMBAT data? .....	18
Q: What program should I use to analyse WOMBAT data? .....	19
WOMBAT publications .....	20
The WOMBAT Community.....	26
WOMBAT Case Studies.....	27
For further information .....	29

# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025



## ABOUT WOMBAT

WOMBAT (Work Observation Method By Activity Timing) is a research technique and tool used to collect data when undertaking direct observational time and motion studies. Using WOMBAT, trained observers can capture multi-dimensional aspects of the activities being observed, record all time data related to activities as they are taking place, and capture interruptions and multitasking (i.e., activities conducted in parallel).

WOMBAT allows researchers to use either validated data collection templates or design their own data collection templates tailored to answer their particular research questions or focus on a specific professional group. Thus, WOMBAT can support the collection of data to answer a wide range of questions about: the work of different professional groups; the impact of interventions and reforms; interactions amongst teams; or patients and their care. While originally developed for research in the health domain, WOMBAT can be used in any field.

### KEY FEATURES OF WOMBAT:

- Continuous recording and automatic timestamping of data
- Recording of multiple dimensions of observed activities
- Recording of interruptions and their nature
- Recording of tasks conducted in parallel (multitasking)
- Customisable data collection templates in any language
- Validated data collection templates
- Offline data collection

### AUSTRALIAN INSTITUTE OF HEALTH INNOVATION

The Australian Institute of Health Innovation (AIHI) is an internationally recognised research-intensive centre within Macquarie University, Sydney, Australia. We collaborate widely, conducting high impact research into health services and systems to make a positive difference for patients, healthcare professionals and society.

# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

## WHY WAS WOMBAT DEVELOPED?

WOMBAT was developed to provide a reliable method for investigating the ways in which health professionals' work and communication patterns change following the introduction of clinical information systems in hospitals. The aim was to advance existing methods, which failed to enable collection of multiple dimensions of work, interruptions and multitasking. In this way, WOMBAT sought to reflect a greater level of the complexity of clinical work.

Interventions and reforms often result in changes to work practices and many questions arise regarding the nature and value of those changes. For example, while there is great enthusiasm regarding the ways in which clinical information systems might streamline work processes and allow greater time in direct care activities, systems may also have negative consequences on some aspects of work efficiency and safety. Thus, there is a need for rigorous studies which quantify the impact of interventions and reforms and assess the nature of changes and their implications.

In the informatics field, we need quality data about how systems enhance or disrupt existing patterns of work and communication, so that we can move to re-design systems and/or work practices in ways which avoid any possible negative outcomes and which take advantage of the benefits information technology presents.

## THE HISTORY OF WOMBAT





# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

## WOMBAT 1.0

WOMBAT 1.0, developed in 2006, allowed trained observers to shadow individuals and record four fixed dimensions of work activities: what task, with whom, where, and how. Each task was automatically timestamped. Instances of multitasking and interruptions could also be recorded. The software was developed for Windows PDA (HP iPAQ running Windows Mobile) [1].

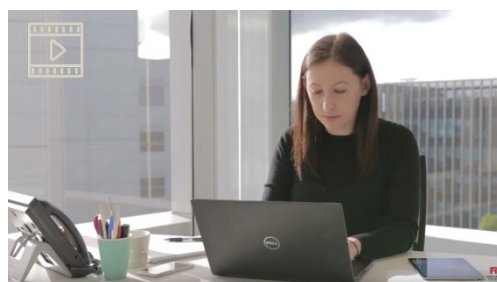
## WOMBAT 2.0

WOMBAT was redesigned in 2011 with the aim of allowing the tool to be used by research teams across the world. WOMBAT 2.0 provided researchers the flexibility to create custom data collection templates that could include the original four dimensions, or different/additional dimensions and variables. WOMBAT 2.0 also allowed interruptions and multitasking to be recorded and examined in greater detail. The new functionality increased the range of research questions that could be addressed with WOMBAT data, and expanded its application beyond health care. WOMBAT 2.0 was developed for devices running an Android operating system (4.0 and above) [2].

## WOMBAT 3.0

In 2019, WOMBAT underwent redevelopment to improve the user interface and usability, and expand its functionality.

WOMBAT 3.0 has been designed for use on devices running the Apple operating system (iOS) including iPad, iPad mini and iPhone. The WOMBAT App is freely available on the App Store and includes a Lite Version, which allows users to explore how WOMBAT works, how data are collected using WOMBAT, what collected WOMBAT data looks like, and examples of measures for analysis. WOMBAT 3.0 allows researchers to include a free text field in their data collection templates, further increasing the capacity to examine and answer different research questions.



[See WOMBAT in action](#)

[Find WOMBAT 3.0 on the App Store.](#)

## References

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# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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## HOW DOES WOMBAT WORK?

WOMBAT is comprised of two separate but interlinked components:

### WOMBAT IOS APP

The [WOMBAT App](#) is the software application that is freely available on the app store. It is recommended to use the latest supported iOS version. Please visit the [app store](#) for further information. The app enables the collection of data which is stored on your iOS device until uploaded to the WOMBAT Web App.

- The Lite Version allows you to explore WOMBAT data collection using the provided sample study collection templates. Collected data is not saved to your device in the Lite Version.
- The WOMBAT Web App is a web portal with a unique address that sits on a secure external server. The web app is where data collection templates are designed and uploaded study data is securely stored
- A licence is required to access the My WOMBAT Studies section of the App where data can be collected and saved. Licenced users are provided with My WOMBAT sign-in credentials, which links the WOMBAT App to a WOMBAT Web App and allows users to access their custom designed data collection templates and upload collected data.

**Note:** The WOMBAT App is not available for Android devices.

## LICENSING WOMBAT

An initial licence term is two-years with yearly extensions available. A WOMBAT licence includes:

- a unique My WOMBAT URL for your WOMBAT Web App where you can manage your user accounts and create study data collection templates for use on the WOMBAT App
- a comprehensive WOMBAT User Manual
- a WOMBAT Data Analysis Guide
- technical support for the duration of your WOMBAT licence.

WOMBAT is licensed to an individual researcher for their research project(s). WOMBAT can be used by researchers associated with the licensee's project(s) to collect data, whether at a single site or multiple sites. However, if these researchers subsequently wish to conduct a new or extended research project, they need to seek their own licence. The initial licensee can use the WOMBAT software for other projects they are involved in for the duration of their licence agreement.

Once licenced, WOMBAT may be used for multiple projects conducted within the licensee's research team and can be installed on as many devices as needed.

[Download the WOMBAT Licence Agreement.](#)

# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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## LICENSING APPLICATIONS

Apply for a licence or extension below:

- [New licence application – Australian users](#)
- [New licence application – International users](#)
- [Licence extension application – Australian users](#)
- [Licence extension application – International users](#)

Once your application is approved, you will be sent information to complete payment of your licence fee. Once payment has been received, your WOMBAT instance will be established and access details provided. It may take up to two weeks for your WOMBAT instance to be established.

## EXPIRATION

During the month prior to your licence expiring, a member of the WOMBAT team will contact you regarding your licence. There are two options available:

- extend the term of your licence for another 12 months
- terminate your licence on its due date and decommission your unique My WOMBAT instance.

Decommissioning will require you to download all study data to your secure network and save all copies of your data collection templates and user information. Once your My WOMBAT instance is decommissioned, your data will no longer be retrievable.

## TRAINING

The WOMBAT User Manual provides comprehensive instructions for using the software and we recommend allowing enough time to train your observers prior to commencing data collection. The manual will be forwarded to you once your WOMBAT instance is established.

A number of instructional videos are also available:

- [What is WOMBAT and how do I use it?](#)
- [Recording a task](#)
- [Recording an interruption](#)
- [Recording a multitask](#)



# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

## IS WOMBAT THE RIGHT TOOL FOR ME?

### WHAT ARE THE ADVANTAGES OF USING THE WOMBAT TECHNIQUE IN MY STUDY?

The WOMBAT tool may be of benefit to you if you are seeking to undertake a direct observational study, particularly to quantify aspects of work and workflow. The use of WOMBAT as a reliable method for quantifying work continues to grow. WOMBAT has been used by research teams from several countries, including: Australia, United States, United Kingdom, Canada, New Zealand, South Africa, Italy, Finland, Sweden and Norway.

WOMBAT allows researchers to design their own data collection templates that can be tailored to answer a particular research question, or to focus on the work of a specific professional group. Thus, WOMBAT affords the ability for researchers to undertake observational studies of different health professionals in different settings and to answer a wide range of questions using a rigorous approach. Examples include:

- examining hospital ward nurses' time in medication related tasks [1] and interruptions during medication related tasks [2, 3]
- assessing hospital doctors' and nurses' patterns of work and communication [4, 5] and measuring the impact of health information technologies [6-10]
- quantifying how and with whom doctors on hospital wards spend their time [11]
- examining intensive care unit nurse workflow during shift change [12]
- quantifying the work patterns of doctors in intensive care units [13-16]
- assessing the rate of interruptions and multitasking by intensive care doctors and nurses [17-19]
- investigating work patterns, interruptions and multitasking in surgical wards [20, 21]
- measuring the work patterns of hospital pharmacists' [22, 23] and the impact of electronic medication management systems [23-25]
- examining pharmacists' workflow in community pharmacy [26]
- quantifying work and interruptions experienced by nuclear medicine technologists [27]
- quantifying junior doctors' work practices after hours and on weekends [28, 29]
- evaluating the impact of a drug monitoring system on nurses' work in ambulatory care [30]
- assessing interruptions and multitasking by doctors in emergency departments [31-35] and their impact on prescribing errors [36]
- examining work patterns and the use of electronic health records in ambulatory care [37]
- quantifying renal dietitians' time [38]
- examining medication management work processes of nurses in home healthcare [39]
- assessing hand hygiene in birth attendants [40].

Researchers can also elect to use validated data collection templates to facilitate comparison of findings with previously published data, which is a great advantage of using the WOMBAT tool. Thus, we suggest that, where possible, you consider using existing definitions of work tasks which will allow you to compare your findings with those from other WOMBAT studies. WOMBAT also provides the opportunity to undertake multi-site and cross-country studies.

# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

## DATA SECURITY

WOMBAT data is stored on your device (iPad or iPhone) until it is uploaded to the WOMBAT Web App. We suggest using security features such as:

- uploading data at the end of each data collection session
- logging out of the WOMBAT App at the end of each data collection day
- using a secure password to lock your device
- not recording any identifying information in WOMBAT free text fields.

Once data is uploaded from your device to your unique My WOMBAT Web App, the data is securely stored on an external server.

Aside from researchers you grant access to, only senior technical (IT) staff at Macquarie University will have access to your WOMBAT Web App instance. This access is solely for the purpose of administering the system and providing technical support, if needed. Your data remains private and secure.

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# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

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# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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## WHAT DO I NEED TO CONSIDER BEFORE STARTING A WOMBAT STUDY?

### WHICH STUDY DATA COLLECTION TEMPLATE – EXISTING OR NEW?

As with any research project, there are a number of key elements that need to be considered when developing the protocol (research plan) for a WOMBAT study.

Consider whether the research question(s) you wish to answer require the development of a new study template, or whether a study template used in a previous WOMBAT study could be used. Developing a new study template can take time and several iterations to ensure all activities of interest are sufficiently captured by the task classification underpinning the template. The task classification (i.e., the definition/scope of each variable included in a study template) needs to be clearly described in the study protocol.

Whenever possible, we suggest using a previously validated study template and/or task classification. If a previously developed study template does not exactly fit your study needs, it may be easy to make some modifications to the template rather than creating a new one. Using a previously developed template should speed up the design process and enable quicker piloting, observer training, and progression to data collection.

### DESIGNING A NEW STUDY TEMPLATE

You need to consider the number of variables (dimensions, categories and subcategories) that you will include. In WOMBAT, it is possible to add as many dimensions and categories as you wish. Bear in mind, however, that data collection will be difficult if there are too many categories, and this may also require observers to scroll the screen and inhibit accurate data collection. Attempting to collect very detailed information will also prove difficult if observers cannot keep up with the speed at which activities change.

Study template designers also need to think about:

- Which dimensions should be mandatory? The first dimension on any study template is the study focus and is automatically mandatory. Other dimensions which are important to the research question should also be mandatory.
- When should dimensions be optional? Optional dimensions can make data collection easier for observers. If, for example, you are only interested in collecting information on computer use for certain tasks then if these tasks are not being undertaken, “computer” does not need to be selected.
- Which dimensions should allow multiple selections? Multiple options and/or selections should be used for dimensions which aren’t the direct focus of the study.

# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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## SELECTING AND TRAINING OBSERVERS

The quality of your WOMBAT data will depend upon the quality of the data collection processes established. Observers need to undergo training and consistency between observers should be tested prior to commencing formal data collection.

As the primary data collectors, observers are integral to the success of any observational study. Whilst it may be desirable to select observers that already have an intimate knowledge of the work environment being studied, this is not always possible. Thus, training is key and training modules should include:

Outlining the purpose of the study, background, method and overview of protocol;

- Providing detailed explanations of definitions used for the study template and task classification, with discussion of examples;
- Instructions on WOMBAT App use (see the WOMBAT App training videos in the WOMBAT Resources section) and further explanation of study template definitions, with practice scenarios;
- Short simultaneous observation sessions between the teaching/experienced observer and trainee observer(s), to ensure the trainee has understood the task classification and is applying it correctly when recording activities in the study template;
- Assessment of inter-rater reliability, with both the experienced and trainee observer simultaneously, but independently, carrying out a thirty-minute period of observation on the same participant. The trainee observer is deemed to be able to carry out independent observational work when inter-rater reliability, as measured by kappa scores, is equal to or greater than 0.85.

The above is as a very general guide. The time it takes to train observers will be highly dependent upon the complexity of the study and the data collected using WOMBAT. If interruptions are involved in the project, the assessment of inter-rater reliability may involve checking the type and frequency of interrupting and interrupted tasks. For those projects with multitasking, the length of time on multitasking should also be examined.

## OBSERVATION SCHEDULE

With the WOMBAT study research questions in mind, consideration needs to be given to determining the observation period (e.g. day/evening/night shifts, weekdays, weekends, public holidays). Observation periods should be equally distributed, and observation of participants should be randomised across the selected times/days/observers. In most previous WOMBAT studies, observation periods were equally distributed across between 0700 to 1900 hours, Monday to Friday. Public holidays were not included. Each observation period was a maximum of two hours, and no individual participant was observed for more than a total of ten hours.

The length of each observation session also needs to be considered. Depending on the complexity of the study data collection template and the activities being observed, each observer may only be able to observe for a total of 1 to 2 hours at a time. After this time period, researcher fatigue may impact on the data quality.



# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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## ETHICS

Ethical approval from an institutional Human Research Ethics Committee may be required prior to commencing data collection. Approval from study sites may also be required.

The principles of ethical research demand that all identifying details obtained by researchers remain confidential. We recommend de-identifying data relating to participants in the following ways:

- Assigning a unique number to each participant at the time of written consent;
- Using only the unique number for data collection purposes;
- Undertaking analysis using only the unique number;
- Keeping any documents linking unique numbers to participant names separate from collected data, and stored in locked cabinets or on password protected computers;
- Limiting access to data to the researchers involved in data collection and analysis;
- Presenting all data in aggregate form.

## FREQUENTLY ASKED QUESTIONS (FAQS)

### Q: What is WOMBAT?

WOMBAT is an acronym for Work Observation Method By Activity Timing. WOMBAT is a research technique and tool used to collect data when undertaking direct observational time and motion studies.

WOMBAT is comprised of two separate but interlinked components: the WOMBAT App and the WOMBAT Web App.

- The WOMBAT App is the software application that is installed on your iOS device (iPad, iPad mini or iPhone) and enables the collection of data, which is stored on your iOS device until uploaded to the WOMBAT Web App.
- The WOMBAT Web App is a web portal with a unique address that sits on a secure external server. The Web App is where data collection templates are designed, and uploaded study data are securely stored.

### Q: Where can I access the WOMBAT app?

The WOMBAT App is freely available on the App Store for download to iPad or iPhone.

### Q: Can I use the WOMBAT app without purchasing a WOMBAT licence?

The WOMBAT App includes a Lite Version. In the Lite Version, you can explore WOMBAT data collection using the provided sample study data collection templates. Please note, collected data are not saved to your device in the Lite Version. A licence is required to access the My WOMBAT Studies section of the App where data can be collected and saved. Licenced users are provided with My WOMBAT Sign In credentials, which links the WOMBAT App to a WOMBAT Web App allowing users access to their custom designed data collection templates and uploading of collected data.

### Q: How much does a WOMBAT licence cost?

A 2-year licence is \$3,500, and yearly extensions are an additional \$1,000 per year. Costs are quoted in Australian dollars and are exclusive of the goods and services tax (GST).

# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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**Q: Is the licence agreement for a single user, a group of researchers, or an institution?**

WOMBAT is licensed to an individual researcher for their research project(s). WOMBAT can be used by researchers associated with the licensee's project(s) to collect data, whether at a single site or multiple sites. However, if these researchers subsequently wish to conduct a new or extended research project, they need to seek their own licence. The initial licensee can use the WOMBAT software for other projects they are involved in for the duration of their licence agreement.

**Q: Once I purchase a WOMBAT licence, how many team members can use it?**

Once licenced, WOMBAT may be used for multiple projects conducted within the licensee's research team and can be installed on as many devices as needed.

**Q: What does a WOMBAT licence include?**

A WOMBAT licence includes a unique My WOMBAT URL for your WOMBAT Web App. The Web App is used to manage your user accounts and to create study data collection templates for use on the WOMBAT App. Your licence also includes a comprehensive WOMBAT User Manual and a WOMBAT Data Analysis Guide. Technical support is available for the duration of your WOMBAT licence.

**Q: Is WOMBAT training available?**

The WOMBAT User Manual provides comprehensive instructions for using the software and we recommend allowing enough time to train your observers prior to commencing data collection. A limited number of instructional videos are available via this website – see section on 'WOMBAT Videos & Resources'.

**Q: How do I purchase WOMBAT?**

To purchase a WOMBAT licence, please see the section on 'How do I obtain a licence?'.

**Q: What languages does WOMBAT support?**

WOMBAT study data collection templates can be created in any language.

**Q: What devices will WOMBAT work on and what are the system requirements?**

The WOMBAT App will work on iPads (optimised for iPad mini) and iPhones. It is recommended to use the latest supported iOS version. Please visit the [app store](#) for further information. The WOMBAT Web App can be accessed from any standard internet browser.

**Q: Will WOMBAT work on Android devices?**

WOMBAT is only available on the iOS platform (iPads or iPhones).

**Q: How secure is WOMBAT?**

WOMBAT data is stored on your device (iPad or iPhone) until it is uploaded to the WOMBAT Web App. We suggest using security features such as: (i) uploading data at the end of each data collection session; (ii) logging out of the WOMBAT App at the end of each data collection day; (iii) using a secure password to lock your device; and (iv) not recording any identifying information in WOMBAT free text fields. Once data are uploaded from your device to your unique My WOMBAT Web App, the data are securely stored on an external server.

# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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Aside from researchers you grant access to, only senior technical (IT) staff at Macquarie University will have access to your WOMBAT Web App instance. This access is solely for the purpose of administering the system and providing technical support, if needed. Your data remain private and secure.

**Q: Who do I contact for more information or if I have further questions?**

Please contact the WOMBAT team via email: [WOMBAT@mq.edu.au](mailto:WOMBAT@mq.edu.au).

**Q: Are there any publications where researchers have reported using WOMBAT?**

Please refer to the section 'Is WOMBAT the right tool for me?' for an extensive list of WOMBAT publications. These publications can assist you in determining if WOMBAT will meet your needs.

## FAQS FOR CURRENT WOMBAT USERS

**Q: I need help using WOMBAT!**

The WOMBAT User Manual provides comprehensive instructions for using the WOMBAT Web App and the WOMBAT App. The WOMBAT team can also assist with technical advice and general questions. If you need assistance, please contact the WOMBAT team via email: [wombat@mq.edu.au](mailto:wombat@mq.edu.au).

**Q: How do I get updates on the WOMBAT software?**

Updates to the WOMBAT App will be delivered via the App Store. When you download the WOMBAT App, it will always be the most up to date release.

**Q: How do I cite WOMBAT in my publication?**

To cite the WOMBAT software in the text of a manuscript we suggest:

...we used the Work Observation Method By Activity Timing (WOMBAT) software (WOMBAT 3.0, 2020)[1]...

To cite the associated reference in the reference list:

[1] Westbrook JI, Ampt A. Design, application and testing of the Work Observation Method by Activity Timing (WOMBAT) to measure clinicians' patterns of work and communication. *International Journal of Medical Informatics*. 2009; 78 Suppl 1:S25-33.

**Q: Who do I contact for technical advice?**

For technical assistance contact a member of the WOMBAT team via email: [wombat@mq.edu.au](mailto:wombat@mq.edu.au).

**Q: When I try to download session data from the WOMBAT web app I receive an error:**

"No sessions found for the study [study name]"

There are a number of factors that could raise this error message:

- The data you previously uploaded could have been "Practice Session" data. Tick the "Practice Session" box and try again. Remember, if the "Practice Session" box was ticked in the WOMBAT App before data was collected, it must also be ticked when downloading data.

# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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- Check that the study template in the WOMBAT App and the study name on the download screen correspond.
- If your role is “Observer”, you may have selected the wrong “Observer ID” prior to starting the observation session. Observers can only download data collected under their ID. Ask your WOMBAT administrator or study administrator to download your data.

## Q: My WOMBAT licence is about to expire – what do I do?

During the month prior to your licence expiring, a member of the WOMBAT team will contact you regarding your licence. There are two options available: (i) extend the term of your licence for another 12 months or (ii) terminate your licence on its due date and decommission your unique My WOMBAT instance.

Decommissioning will require you to download all study data to your secure network and save all copies of your data collection templates and user information. Once your My WOMBAT instance is decommissioned, your data will no longer be retrievable.

## ANALYSING WOMBAT DATA FAQs

### Q: How do I analyse WOMBAT data?

The WOMBAT Data Analysis Guide provides a guide to WOMBAT data analysis. If you need further assistance, we recommend seeking advice from a qualified statistician. The following reference may also be of assistance:

- Walter SR, Dunsmuir WTM, and Westbrook JI. (2019) Inter-observer agreement and reliability assessment for observational studies of clinical work. *J Biomed Inform* 100: 103317.

### Q: How do I calculate IRR?

Inter-rater reliability (IRR) assessment is a fundamental aspect of data quality when there are multiple observers. Assuming you have performed one or more sessions where multiple observers have simultaneously, but independently, followed the same participant, then assessing IRR for WOMBAT data has some unique considerations. Since tasks time stamps rarely agree exactly between parallel observers, assessing IRR at task-level is very difficult. Instead it is better to convert the data to small time windows, where window width is defined by the smallest time unit. For example, if time stamps are recorded to the nearest second, then one second windows should be used. Univariate or multivariate chance-adjusted agreement measures can then be applied to the time window data to generate time-based IRR estimates. Where multiple variables are to be used in the analysis, assessing multivariate agreement is recommended. This can be done with the iota score for nominal variables [1], or under some conditions the mean of univariate Cohen’s kappas can be used. Relevant details are discussed in Walter et al. [2] section 12.3.

[1] Janson H, Olsson U (2001) A measure of agreement for interval or nominal multivariate observations. *Educational and Psychological Measurement* 61(2): 277-289.

[2] Walter SR, Dunsmuir WTM and Westbrook JI. (2019) Inter-observer agreement and reliability assessment for observational studies of clinical work. *J Biomed Inform* 100: 103317.

### Q: Can I use hypothesis tests (e.g. t-tests) on WOMBAT data?

The type of analysis methods depends on the study design and the research questions, but in general there are several caveats with using conventional hypothesis tests. The most important consideration is that

# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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WOMBAT studies tend to be observational and hypothesis tests applied to such data ignores confounding factors and can then produce biased results. Such tests should only be applied if the design allows, as when confounding factors are controlled by some means. Otherwise multivariate methods should be used instead of simple hypothesis testing. If testing is appropriate in your context then consider Monte Carlo testing as this avoids distributional assumptions which are often not satisfied by WOMBAT data.

**Q: What program should I use to analyse WOMBAT data?**

The choice of software for analysing WOMBAT data is essentially up to the researcher. Ideally a program that allows custom manipulation of data through written commands is preferable if the researcher has skills in using one of those, for example R, SAS, Stata or SPSS. It is possible to use spreadsheet programs such as Excel, but this tends to be time consuming and error prone.

A set of SAS macro programs, and accompanying guidance documentation, are that will calculate summary statistics with confidence intervals. These can be implemented by anyone with basic SAS skills. If you would like a copy of the SAS macro programs, please contact the WOMBAT team via email: [wombat@mq.edu.au](mailto:wombat@mq.edu.au).

# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

## WOMBAT PUBLICATIONS

### STUDIES THAT HAVE EMPLOYED WOMBAT

#### Papers published by the WOMBAT Team

1. Ampt A, Westbrook J, Creswick N, Mallock N. A comparison of self-reported and observational work sampling techniques for measuring time in nursing tasks. *Journal of Health Services Research & Policy*. 2007;12(1):18-24.
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# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

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What you need to know

July 2025

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# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

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# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

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# Work Observation Method By Activity Timing (WOMBAT)

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What you need to know

July 2025

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# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

## THE WOMBAT COMMUNITY

A primary aim of making the WOMBAT tool more widely available is to build the evidence base regarding health professionals' work and communication patterns, how these are influenced by interventions such as the introduction of clinical information systems, and how changes in work relate to efficient, safe and effective care.

We welcome any feedback on WOMBAT. Please email us with your study details, experiences and ideas at [wombat@mq.edu.au](mailto:wombat@mq.edu.au).

## THE WORLD OF WOMBATS



80 WOMBAT licences across 20 countries

April 2025



# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

## WOMBAT CASE STUDIES

### WORK PATTERNS IN RENAL NUTRITION

This study was conducted by Assistant Professor Rosa K. Hand and colleagues in the Department of Nutrition, School of Medicine at Case Western Reserve University in Cleveland, Ohio, USA.

Like other health professionals, there are concerns about registered dietitian burnout and workload. In the US, dialysis is a unique healthcare environment because a) most dialysis is paid for by the Centers for Medicare and Medicaid Services and b) a registered dietitian is a required member of the interdisciplinary team and has the ability to establish long-term relationships with patients. However, dietitians self-report that they are being asked to take on more and more administrative and documentation responsibilities, limiting the time for behavior change counseling.

This study used a newly developed WOMBAT template to quantify these patterns. In a small sample, we demonstrated that WOMBAT can be used with allied health professionals like dietitians and in outpatient settings like dialysis.

Our findings about the proportion of time spent in direct care (25%), communication (20%) and transit (7%) have surprising similarity to those described in med/surg nurses using WOMBAT methodology previously (Westbrook et al 2009).

These results were published in the [Journal of Renal Nutrition](#).

### PHYSICIAN TIME IN AMBULATORY CARE

This case study was undertaken in the USA where a new study template was devised to look at physician time in ambulatory care settings.

Following the results of a large survey, which revealed signs of burnout and growing dissatisfaction with work-life balance amongst US physicians, the American Medical Association were interested in quantifying how physicians in ambulatory care spend their time. In collaboration with the Dartmouth-Hitchcock Medical Center and the Centre for Health Systems and Safety Research, Macquarie University, the researchers undertook a WOMBAT study of 57 physicians working in 4 specialties (family medicine, internal medicine, cardiology, and orthopaedics) across 4 states (Illinois, New Hampshire, Virginia, and Washington).



A physician work task study template for ambulatory care was devised, which included 12 broad work task categories grouped under four key activities: direct clinical face time; electronic health record (EHR) and desk work; administrative tasks; and other tasks. Ten medical students were trained regarding the study template classification definitions and how to use WOMBAT. The students undertook 430 hours of observation of ambulatory physicians' work.

The findings showed that during office hours, ambulatory care physicians spent nearly half their time on EHR and desk work activities and less than one third on direct clinical face time with patients; in other words, for every hour of direct clinical face time with patients, physicians spent almost 2 hours on EHR and desk work. Such findings provide critical information in characterising the ambulatory care domain

# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

regarding what work is done and for how long. Using WOMBAT allowed the researchers to describe ambulatory physicians' time distribution objectively, capturing work and interactions both with and without electronic devices, and provided a broader view of the role and use of the EHR in the ambulatory environment.

The study was published in [Annals of Internal Medicine](#).

## WORK PATTERNS OF INTENSIVE CARE UNIT DOCTORS



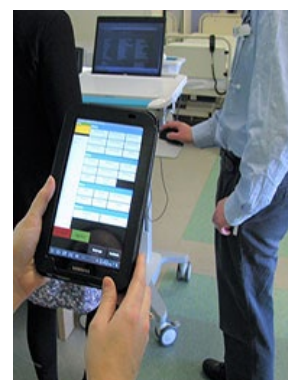
This case study was undertaken by a research team in Australia used an existing work study template (previously applied in studies looking at doctors on wards and in emergency departments) to examine the work of intensive care doctors.

The intensive care unit (ICU) is known to be a complex environment, where clinicians care for some of the most acutely ill patients in hospital. Decision making in intensive care is also multifaceted and involves collaboration between ICU doctors, medical teams from other specialties, as well as multiple information elements including flow charts, patient notes, medication charts, vital signs, test results, and images. The aim of this study was to measure how ICU doctors spend their time, what information resources they use to assist their work, with whom they work, and how often they multitask or are interrupted. A secondary aim was to compare the work patterns of ICU doctors with those of doctors on general wards and in emergency departments from previously published WOMBAT studies.

The study was conducted in two ICUs at two major teaching hospitals in Sydney and involved 26 doctors. Two observers used an existing WOMBAT study template and task classification to record over 160 hours of observation. The findings showed that ICU doctors spent 69% of time working at patients' bedsides, 50% of time in professional communication, and 39% of time accessing information resources. Over half (54%) of their time was spent with other ICU doctors and 29% with nurses. ICU doctors had a high multitasking rate (40 times per hour) and were interrupted 4 times per hour.

Compared with doctors on general wards and emergency departments, ICU doctors spent more time in professional communication, more time with patients, and more time with nurses. ICU doctors were also more likely to multitask. By using a study template and work task classification used in previous WOMBAT studies, the researchers were able to demonstrate how ICU doctors manage their time and work demands compared with their colleagues on general wards and in emergency departments. Using WOMBAT allowed the researchers to quantify the more complex environment of the ICU, which necessitates high levels of multitasking and interdisciplinary collaboration to care for acutely ill patients.

The study was published in [Critical Care and Resuscitation](#)



# Work Observation Method By Activity Timing (WOMBAT)

What you need to know

July 2025

## FOR FURTHER INFORMATION

### THE WOMBAT TEAM



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